Industrial

July 1946

Standardization

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Company Members—

Some 2000 Industrial concerns hold membership either directly or by group arrangement through their respective trade associations

Readers Write

Why No Periods in Abbreviations?

E. I. du Pont de Nemours & Company

Gentlemen: The appearance in recent issues of INDUSTRIAL STANDARDIZATION of instances where periods are omitted after abbreviations used in ordinary writing (Mr, Dr, Inc, Assn, emer alt) in defiance of the prevailing practice in the United States, and apparently in defiance of the copy editor's attempt to apply the practice consistently, even on a single page, prompts me to bring before your readers the campaign which I have been carrying on since the promulgation of ASA Z10.1-1941 (see INDUSTRIAL STANDARDIZATION, April, 1941) against the adoption of the recommendations there set forth regarding the omission of periods after abbreviations.

English is in good part a phonetic language, at least it is not ideographic; and characters appearing on a printed page should have some counterpart in sound, or else should be flagged with a period, or set off in some other way (as by capitalization, in a line of lowercase), to indicate that they are to be read otherwise than as they appear. How is one to know that emf is to be taken as E-M-F, and not pronounced as written, as a one-syllable word?

The compromise retained in ASA Z10.1-1941 is not enough (that periods be used after combinations of letters that make an English word); "psf" is not an English word, but "psi" is in the dictionary (as good a word as iota or delta). The abbreviation psia looks like the name of some plant; and mphps is hopeless as the abbreviation for a unit of acceleration. To read about an engine cycle having an imep of so many psig is scientific jargon at its worst.

The arguments advanced for the omission of periods are without justification. The saving of space is negligible; and the saving in the typesetter's time is of no consequence compared with the extra time required for comprehension on the part of the readers for whose benefit the typesetting is done.

I hope that those who join with me in deprecating the spread of the omission of periods after abbreviations will join with me in making such representations to the Committee on Symbols and Abbreviations (Professor H. M. Turner, Yale University, Chairman) as to influence them to modify their recommendation in regard to this practice.

T. H. CHILTON

• • The American Standard Abbreviations for Scientific and Engineering Terms, Z10.1-1941, was prepared by a nationally representative sectional committee on which scientific and technical associations, national engineering societies, government departments, and technical publications were members. The committee is sponsored by the American Association for the Advancement of Science, the American Institute of Electrical Engineers, the American Society of Civil Engineers, the American

Society of Mechanical Engineers, and the Society for the Promotion of Engineering Education. Professor H. M. Turner, Yale University, is chairman of the sectional committee, representing the American Institute of Electrical Engineers and the Institute of Radio Engineers. Dr Sanford A. Moss, General Electric Company, is vice chairman, and represents the American Society of Mechanical Engineers. George A. Stetson, editor, of *Mechanical Engineering*, American Society of Mechanical Engineers, is chairman of the subcommittee that was in direct charge of the preparation of the 1941 edition of the abbreviations standard. This sectional committee has also completed seven American Standards for letter symbols for use in different engineering fields.

One of the fundamental rules laid down in American Standard Z10.1-1941 is that "The period should be omitted except in cases where the omission would result in confusion." In applying this principle, the editors of INDUSTRIAL STANDARDIZATION have decided to omit periods in all abbreviations except when the abbreviation spells a word (for example, in the abbreviation for inch, "in.") or in single letter abbreviations in names (New York, N. Y.; G. E. Smith).

Standard Size for Engineering Handbooks?

Republic Steel Corporation

Gentlemen: We have a problem of choosing the size for a handbook of engineering data prepared for engineers, designers, and purchasing agents. Similar books, we find, are generally made either in standard letter size, about 8½ by 11 inches, or in pocket size, approximately 5½ inches by 8¼ inches. Do you have any information from surveys, standard specifications, resolutions, or other sources which indicate the size preferred by those who receive this type of material?

JOHN F. SPENCER
Advertising Division

• • The American Standards Association has no definite information about any preference for particular sizes in handbooks. This comes under the general problem of standardization of paper sizes, including sizes of books, magazines, letterheads, all kinds of office forms, etc. A request for initiation of a project on standardization of office supplies and equipment, including paper sizes, has been before the ASA for some time. Recently, a poll of stationery dealers taken by the *Modern Stationer* concerning sizes of manufacturers' catalogues and price lists resulted in 94.8 percent preference for 8½ x 11 inches.

Our Front Cover

An open hearth furnace in a Pittsburgh steel plant. Photo by Charles Phelps Cushing.

Industrial Standardization

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Contents

July, 1946 Ruth E. Mason, Editor 35 Cents

The American Standards Association is a federation of national groups dealing with standardization. Through it, government, industry, labor, and the consumer work together to develop mutually satisfactory national standards. It acts as the authoritative channel for international cooperation in standardization work.

Subscription price $4.00 per year (foreign $5.00). Special to schools and libraries $2.00 (foreign $3.00). Re-entered as 2nd Class Matter 7/31/43, at the Post Office, New York, N. Y., Act of March 3, 1879.

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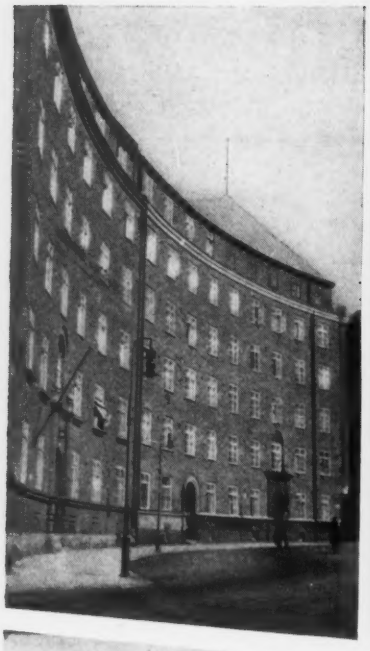

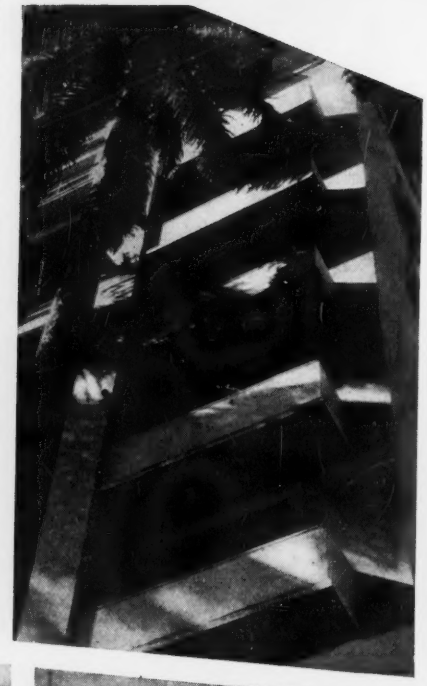

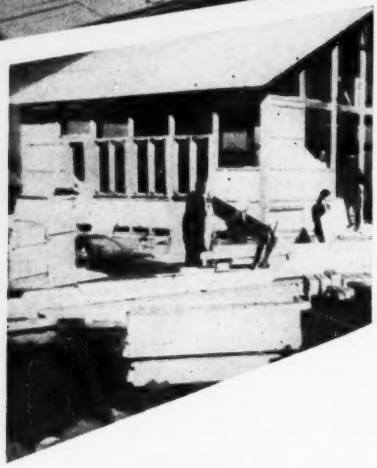

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About International Standards for Building Dimensions?

THE international nature of the housing shortage is bringing to the United Nations Standards Coordinating Committee suggestions for international standards to help bring about more rapid progress in building. The French national standardizing body, Association Française de Normalisation, has asked the UNSCC for an international project through which a standard building unit (10 cm as recommended in the French standard; 4 in. as recommended in American Standard A62.1-1945) could be established for the coordination of dimensions of all building materials and equipment. The reasons why France considers that an international standard module would be helpful are presented below. Sweden, too, is making use of the modular system and is interested in an international standard unit. How Sweden is reorganizing its building industry is described on page 162.

In the United States modular coordination of building materials and equipment is being developed through Project A62 sponsored by the American Institute of Architects and the Producers Council under the procedure of the American Standards Association. In the basic standard already approved under this project (American Standard Basis for the Coordination of Dimensions of Building Materials and Equipment, A62.1-1945), a 4-in. module was selected as the unit that offers the maximum practical standardization and simplification and is most consistent with present building practice. The American Standard Basis for the Coordination of Masonry, A62.2-1945, applies the modular system to the sizes and dimensions of masonry products. Subcommittees are now working on standards to apply the principle to other building materials and products. Near completion in this program are standards for coordination of cement and concrete masonry unit and for sizes of certain types of steel windows and of wood windows.

France Requests an International Module

THE reconstruction of cities destroyed during the war has placed building problems in the forefront of those with which the French Standards Association is now preoccupied.

In order to be able to build quickly, i.e., with as few finishing processes as possible, and economically, i.e., with materials at a low cost price, it is necessary that the components of a building should be thoroughly considered in relation to each other, and fully standardized.

France considers it would be of great value if a detailed exchange of views could be arranged internationally so as to enable the ideas of the various countries to be compared objectively and the solutions adopted by the different standards organizations brought as closely together as possible.

It is probable that commercial transactions in this field, which before the war involved only materials and semi-finished products, will extend in future to certain prefabricated building components.

No committee existed in the International Standards Association for the consideration of building problems. For certain related questions, however, there were in particular ISA Committee 17 on Steel, which dealt with the sizes and qualities of structural steel sections, and ISA Committee 33, which dealt with refractory products.

On the other hand, many countries have studied these questions more or less systematically.

More than a hundred standards have been drawn up in France, and the French Standards Association has suggested that consideration be given to the following questions:

1. Choice of an international metric module—

The concept of a module is familiar to building experts all over the world. Any standardization in the building field, if it is to be coordinated, must be based fundamentally on the module principle.

Before the war France had started to study this question. At about the same time, certain experts in the United States, particularly Albert Farwell Bemis, evolved a precise definition of the module concept. Other countries such as Germany had also done some work along these lines.

French standards are based on the standard NF P 01-001 which calls for a module of 10 cm and allows the use in some cases of the submultiples 5 cm and 2.5 cm. This standard might be taken as the basis for discussion. It might be pointed out that the American Standard Basis for the Coordination of Dimensions of Building Materials and Equipment, A62.1-1945, recommends the use of a 4 in. (10.16 cm) module which is very near the French module in view of the tolerances which must be allowed in building.

2. Unification of the methods of dimensioning on architectural drawings—

The question of building tolerance which arises as soon as the problem of the module comes into discussion deserves in itself a special study. This will almost certainly result in the specification of guiding principles for the unification of the

The pictures—Left to right: Top—Finland; Brazil; Great Britain. Center—Denmark; Sweden; Canada. Bottom—United States; Italy; Russia.

method of dimensioning architectural drawings.

France has drawn up a standard, NF P 01-007, which sets out the methods for the application of the module, taking into account the tolerances which are normally allowed in the manufacture of the various building components.

This document is submitted as the basis for international discussion.

3. Set-out of drawings—

It would appear useful to compare the work done in the various countries to unify the set-out of drawings. Frontiers are no longer rigid enough barriers to prevent drawings and plans made in one country from being read in others. It would therefore be of value if in this connection some coordination could be brought about internationally.

Almost every country has issued standards regarding drawing office practice and France submits for consideration a number of standards and draft standards (NF P 02-001 to 02-015).

4. Unification of methods of test and standards of quality for the various usual building materials—

Materials in every country are covered by specifications which are generally standard. It would be of the greatest value if the various national standards could be compared in order to determine the best methods to be recommended. The specifications of more special interest appear to be those regarding cements, limestone, bricks, tiles, and various ceramic products, rolled steel bars for concrete reinforcement, pipes and fittings, and taps and tap fittings.

France has submitted on these subjects a fairly complete set of standards and draft standards.

5. Unification of dimensions for interchangeability and overall dimensions of equipment and appliances—

A study of these questions would be of the greatest help to a country importing equipment and appliances.

Dimensions of lavatory basins; taps; gas, coal, and electric cookers; heating appliances (boilers, stoves, radiators) could profitably be studied so as to facilitate the installation of such equipment and appliances through a closer alignment of methods used in the various countries.

There are in existence a few French standards which show the scope of the proposed coordination.

6. Unification of acoustical and heat measurement methods—

These methods of measurement are rather difficult to determine. They are nevertheless at the root of many discussions between contractors, architects, and their clients. An international exchange of views would make it possible to ascertain the solutions adopted in the various countries. France, where some consideration has already been given to the question, would welcome international conversations on the subject.

Basis of French Building Standardization

French building standards as a whole may be divided into two categories.

(1) Standards defining the quality of building materials and the relevant methods of testing the materials. Their object is to ensure sound and durable construction. This class of standards has no special feature and is similar to that which has been done abroad in this connection.

(2) Dimensional standards designed to promote as great a simplification as possible in building practice. Such standardization endeavors to encourage the development of the prefabrication of building components of as large surface as possible and at the same time to reduce to a minimum the time and expense involved in mounting these components. This standardization is based on the French Standard Building Module and on all the dimensional standards strictly in accordance with the module. It is not therefore a question of constructing buildings in series, but while allowing full freedom in matters of architectural design, to promote, to the largest possible extent, industrialization of the building industry. It is not in the matter of design that a change is called for, but in actual practical building methods.

This conception has so far only rarely received practical application, but that it answers the requirements of our times is shown by the fact that it has made an appearance almost simultaneously in a considerable number of countries.

Sweden's Building Industry Grows Up

IN Sweden the problem of reorganizing the building branch from a handicraft into an industry has been particularly interesting due to the shortage of housing which occurred in Sweden during World War II. To facilitate this reorganization a special state institute, Byggstandardiseringen (Building Standards Institute), for the standardization of building materials was established in 1942, affiliated with the Sveriges Standardiseringskommission, SIS (Swedish Standards Association).

The task of the Building Standards Institute is to prepare standards for all building parts which may be subjected to industrialized mass production. The task of standardization includes detailed studies concerning the various functions of the different building parts and their most appropriate design, particular consideration being given to their industrial production.

However, owing to the fact that all building parts on the building site must be combined to form a completely uniform building, it was made clear at the very start of the standardization work that it was necessary to establish uniform standards of measurement for all material and building parts used in the frame, fixtures, and installations.

Therefore, in the year 1943 an investigation was commenced, in collaboration with representatives from the entire Swedish building materials industry, with regard to uniform measurement standards, the so-called "Module Investigation." The investigation resulted in the determination of a building module of 100 mm which therefore differs by only 1.6 mm from the building module of 4 in. suggested in America.

The findings of the investigation, which embrace proposals for standards for bricks and other wall materials, stairs, lifts, kitchen equipment, floor material, plumbing installations, and heating and installation materials, are now being printed in Swedish. It is also planned to print

these standards proposals in English.

The investigation was directed by Lennart Bergvall and Erik Dahlberg, both architects SAR.

The Housing Situation in Sweden

Building costs in Sweden are very high. The production costs for a one-family house, comprising two rooms and a kitchen, with an area of about 550-650 sq ft, are normally around Kr 20,000 ($5,000), while the annual income for an industrial worker is roughly Kr 3,500—Kr 4,000 ($1,000). These high building costs have given rise to great difficulties, particularly in filling the need for houses in industrial areas. The industry is therefore particularly interested in a reduction of building costs.

Building activity in Sweden is mainly in the hands of a large number of comparatively small builders and building contractors. Admittedly there exists a larger cooperative enterprise for the production of apartment houses and, in the wooden house branch, a combine of several producers of prefabricated wooden houses, "AB Svenska Trähus" (The Swedish Wooden Housing Company) but, nevertheless, the possibility of rationalization which it was hoped would be achieved by prefabrication has hitherto not been applied to the desired extent.

AB Bostadsforskning (Housing Research, Inc)

In order to enable a more rapid development of the building branch, two of the larger Swedish industrial concerns, Uddeholms Aktiebogal and Skanska Cement-aktiebolaget initiated in 1944 a special research organ in the building branch "AB Bostadsforskning" (Housing Research, Inc). The task of this company is to investigate the possibilities of reorganizing housing on an industrial scale in order to achieve a really considerable reduction of building costs. The investigations now progressing embrace mainly smaller houses, especially one-family, generally with a wooden frame, but it is intended gradually to widen the studies to include also apartment houses of stone materials. The studies, which have been carried out partly theoretically and partly experimentally, both on a laboratory scale, and in the form of whole experimental houses, cover all building parts from the foundation to the complete building, i.e., except the wooden frame, also the foundation, installations, cellar, exterior and interior finish, fittings, etc. The investigation has hitherto resulted in a system of building based on strictly standardized, narrow wall and flooring sections with module standard measurements, which sections can be mass produced, but which, by reason of their small width will greatly facilitate the individual designing of these sections. A prefabricated chimney construction has also been worked out and prefabricated pipes and fittings based on module standard measures are under work, also the construction of a plant for the mass production of the various house sections.

President Truman Recommends Transfer of Commercial Standards

RECOMMENDATIONS for the transfer of the functions of the Division of Simplified Trade Practices and the Division of Commercial Standards out of the National Bureau of Standards were presented to the Congress by the President of the United States May 16. This move, the President explained, would permit the Secretary of Commerce to reassign the functions of the two divisions to the Office of Domestic Commerce, which is the focal point of the Department's general service functions. Two principal benefits can be expected from this transfer, the President declared. By removing the two Divisions from the National Bureau of Standards any possibility of confusion as to whether the standards and trade practices worked out by industry with the help of these two Divisions are Government standards based on scientific and objective tests would be eliminated. In addition, the move would concentrate in the Office of Domestic Commerce all the general services of the Department to American business.

President Truman's message to Congress explained his recommendations as follows:

"These two divisions were established as a result of the standardization work initiated in World War I. Both divisions have followed the same basic procedure of assisting the producers and the consumers of particular products to agree among themselves on certain standards or on a certain limited number of varieties. Each such voluntary agreement is then published by the National Bureau of Standards and, although not compulsory, has tended to become the generally accepted practice in the trade.

"Standardization again proved to be an important device for accelerating production in World War II; and industry has shown renewed interest in continuing these wartime conservation and rationalization programs on a voluntary basis in the production of peacetime products.

"The desirability of the proposed transfer was emphasized only a few months ago by the report of a committee of prominent businessmen appointed by the Secretary of Commerce to review the entire question of the Government's activities in this field. These studies indicate that two major benefits will result from the transfer.

"First. The association of the two divisions with the National Bureau of Standards has perhaps tended to give the impression in some quarters that voluntary standards and trade practices worked out by industry with the help of these two divisions are in some sense Government standards which are enforced on the basis of scientific and objective tests. The transfer of these two divisions to the Department proper would reduce any such misconceptions, and make it clear that these standards and simplified practices are voluntary industry agreements in the making of which the Government acts merely in an advisory capacity.

"Second, the other general services of the Department to American business, such as marketing management, and economic and statistical services, are now concentrated in the Office of Domestic Commerce. The association of these two divisions with these other services to business will facilitate their work and enable them to make use of the wide industrial and business contacts of the Office of Domestic Commerce."

The recommendations were referred to the Committee on Expenditures in the Executive Departments.

New Committee Formed On Consumer Standards

Following a theory that laboratory technicians cannot develop consumer goods standards until they have a better idea of what the consumer desires in the merchandise he buys, it has been reported that the National Research Council and the Social Science Research Council have recently set up a joint committee to relate the one to the other.

Banner Year for

★ ★ ★ ★

Latest figures released through the U.S. War Department show a marked decrease in the number of accidents in the Army Service Forces Depots since the Quartermaster Corps began to use standard colors for identification of potential hazards. The colors used in the early experiments of the Corps were later codified and were used in the development of the Safety Color Code (American War Standard Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1945) approved by the American Standards Association. Safety records of 26 Quartermaster Corps and Army Service Depots show that certain types of accidents were reduced from a frequency of 46.14 to a yearly average of 5.58, while others were entirely eliminated after the standard colors were put into effect. One Depot estimated that during the first year after adoption of the code disabling injuries were cut from 13.25 to 6.99 per each 1,000,000 man hours worked.

Statistical information such as this, together with reports from individual

Historical Growth of Color Standard Reviewed on Anniversary of Approval

By Henry G. Lamb

Safety Engineer, American Standards Association

THERE is nothing new in the use of color to "convey a message" for the prevention of accidents or for protection from fires in industry. Many years ago, fire insurance companies recognized the need for the use of first aid fire-fighting equipment to put out small fires as the best means of preventing conflagrations. In order to do this, they recommended to industry that pails of water, pails of sand, and fire extinguishers be placed at convenient locations throughout each plant in order that they would be quickly available whenever they were needed.

Unfortunately, when these pails were installed the employees did not understand that they were to be used only in case of fire, and so some of these pails were used for any odd job needed around the plant. In some instances round bottoms were put on the pails, but they were still used at times for mopping the floor or for bailing out a tank. In fact, some of them were even used to contain kerosine or gasoline for the purpose of washing up dirty machine parts. When a fire started, pails were not available or were filled with some flammable liquid which was worse than nothing at all. There have even been cases where employees in a plant took down the fire hose to wash down the floors. In order to combat this tendency, the fire insurance companies suggested that the fire pails and fire extinguishers should be painted red. The original significance of this color red was "Don't touch" or "Don't use except in case of fire".

The companies hoped thereby to educate the employees away from their careless habit of using these pails for any purpose which they might have at the moment. In addition, the red color stood out in contrast to the average factory background so that it also served the purpose of quick identification and location when the pails were needed in a hurry.

This use of the color red has been so effective that it is almost universally accepted at the present time.

To digress a little bit from the industrial side of the picture, color has played an important part in directing traffic on our streets. Today everyone is familiar with the red stop light and the green "go ahead" light on our highways. This uniform use of the colors has been brought about only by the national adoption of a standard. There was a time when the traffic lights on Fifth Avenue were red and green, but the green meant to stop and the red was the caution signal. At that time the other cities throughout our land had probably every combination of colors that could be conceived and every tourist traveling from one city to another met with utter confusion. Today the standard traffic lights have been so universally adopted that tourists think nothing of driving from New York to San Francisco and back again without any thought of changes in the significance of the traffic lights.

In 1928, an American Recommended Practice Scheme for the Identification of Piping Systems was approved. This extended the previous use of colors in industry to the identification of various piping systems used for steam, water, liquids, and air throughout a plant. Here, the color red was extended to include the identification of sprinkler piping as part of the fire protection system. The range of colors from yellow to orange was recommended to designate piping containing dangerous materials such as acids, caustics, and high-pressure steam. Green was recommended for safe material such as ordinary drinking water, low-pressure air, and other safe liquids; blue was designated for protective materials other than fire protection; and purple was to be used for the identification of extra-valuable materials. This scheme had as its primary purpose

(*Continued on page* 166)

Safety Color Code

companies concerning their particular adaptations of the code, show that the value of color in providing adequate safety for employees is being stressed more and more strongly. Although the code is a comparatively recent innovation, its merits are already evident in both industry and government.

Since the War Department contributed much to the development of the code, and has since experimented with it on a wide scale, an account of the results obtained through its use in the Army Service Forces Depots may provide helpful suggestions to others. Such information has been compiled by O. P. McCauley, director of safety at the Richmond Depot, and Clinton B. Allen, storage and safety specialist of the Office of the Quartermaster General, in the form of a report which is published below.

A history of those factors which brought about formulation of the American War Standard Safety Color Code is contained in a brief resume prepared by Henry G. Lamb, ASA safety engineer (page 164).

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Army Experiences with Color Offer New Suggestions for Industrial Use

By O. P. McCauley and Clinton B. Allen

INTEREST in the standard coding of colors for marking fire-fighting equipment, physical hazards, traffic signs, and road markings was first aroused in the management of the Richmond Army Service Forces Depot early in 1944. The Depot safety director had noted on his arrival at this Army supply installation that the various supply groups had painted the walls behind fire extinguishers some distinctive color. The Engineers used three-inch green-and-white herringbone stripes; the Maintenance Division used plain white; and some groups even used the conventional bright red. The need for uniformity was apparent.

A study of injury reports disclosed that the need for marking tripping hazards was very evident and collisions of mechanical warehouse materials-handling equipment with corners of stacked material called for further thinking on the part of the safety director.

The trial color code used at the Richmond Depot was adopted in the fall of 1944 and was parallel to the code approved by the American Standards Association, July 16, 1945, as far as it went. Bright red was used for marking fire protection equipment such as fire alarm pull boxes, fire buckets, extinguishers, and extinguisher locations. Bright yellow was used for marking physical hazards, particularly tripping and "striking against" hazards. White replaced yellow for marking aisles and street markings.

Probably the greatest results have been obtained from the use of yellow for distinguishing physical hazards. With no training whatever, the almost 3000 employees of the Richmond Depot have learned to respect yellow-and-black herringbone stripes and plain yellow (where the striping is not practical) as designating a hazard.

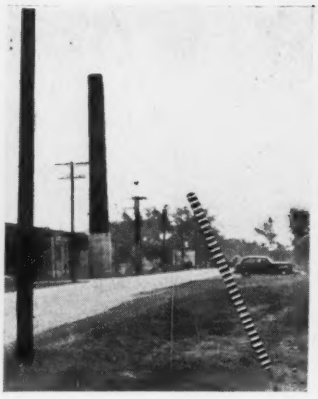
O. P. McCauley *is director of safety at the Richmond Army Service Forces Depot and* ***Clinton B. Allen*** *is employed as storage and safety specialist in the Office of the Quartermaster General.*

Yellow-and-black herringbone stripes were first put to work on cornerboards placed at aisle intersections in the warehouses. The cornerboards are L-shaped, that is, they have two sides 21 inches wide by 30 inches high which are joined together at the 30-inch edge to form an L. It was interesting to note the decrease in damaged material caused by fork lift trucks and tractor-trailer trains cutting corners. The attendant hazard of falling material was also eliminated. Another great saving from the use of the cornerboards was in the repacking of material in undamaged containers.

Guy wires supporting power line poles were a tripping and "striking against" hazard, both to pedestrians and mounted patrolmen. Damage was sometimes caused by trucks backing into the guy wires. The effectiveness of guy wire guards painted with black and yellow stripes is attested to by the Depot accident records. Since these guy wire guards have been installed not a single accident from this cause has been reported.

The greatest saving in accident costs that can be directly attributed to the use of yellow paint in reducing tripping accidents is found in marking the edges of warehouse trailers. The Richmond Depot uses almost three thousand of these trailers in handling the many and varied types of material received, stored, and reshipped there. These trailers are three feet wide and six feet long with a coupler at each end projecting thirteen inches. The flat bed and coupler of the trailer are just fifteen inches from the floor. When received from the manufacturer, these handy four-wheel conveyors are painted black. Place one of these dark objects in a dimly illuminated

(*Continued on page* 167)



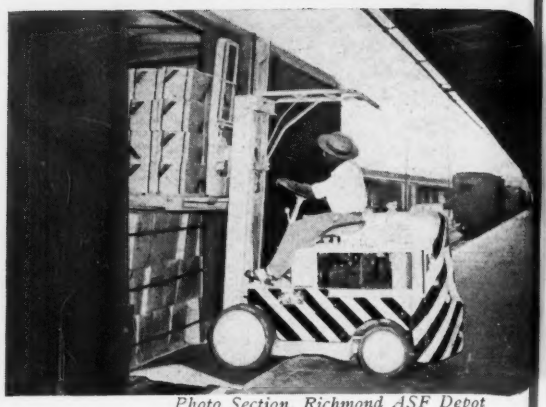


Photo Section, Richmond ASF Depot

Black-and-yellow "barber pole" stripes on fire hydrant and guy wire guards are standard to reduce traffic hazard.

This fork lift truck, and edges of platform and gangboard are highly visible in "high visibility" yellow.

Historical Growth of Color Standard

(*Continued from page* 164)

prevention of accidents to pipe fitters and maintenance men who, from time to time, are called upon to cut into a piping system either to make an extension or to make repairs. If all of the pipes are painted the same color and several lines are running parallel and in close proximity to each other, it is sometimes difficult to trace out a line and ascertain that it is a harmless water line that is being cut into, rather than another pipe which may contain a corrosive acid.

The next nation-wide agreement on the use of colors came from the committee on accident prevention signs. In 1941, this committee brought out a standard for the shape, arrangement, and coloring for various signs such as danger signs, caution signs, and instruction signs. On the danger signs, the most prominent feature is a large red oval with the word "Danger" printed in white letters in the middle of it. Underneath this section is the warning of the specific danger such as "Explosives" or "2300 Volts". The caution signs have a yellow background and the word "Caution" is printed in yellow on a black rectangular background. Green was used for safety instruction signs such as "Report All Injuries to the First Aid Room at Once".

There have been several other uses of color in industry which through time and use have now become customary. For instance, practically all of the "safety cans" which you buy are painted red. For a long time it has been customary to paint exit signs in red or to make them of luminous material with a red light showing through. As far as these exit signs are concerned, the latest revision of the Building Exits Code, approved in 1942, made a change in this standard and now it is recommended that exit signs should be painted green or illuminated with a green light. Probably a great deal of the thinking of this committee was based upon the now universally accepted traffic lights where red means to stop and green means to go. In line with this public conception, it is only natural to paint an exit sign in a color which means to go or go through the exit rather than to paint it red which, to most people, means to stop rather than to go. It can be readily seen that through the years different groups in different places have adopted some color combination to carry a safety message, but there has been comparatively little effort made to coordinate the various color ideas or to establish a uniform color system which would probably combine all of these different colors and all of these different uses of color.

One of the earliest attempts along this line was made by the manufacturing division of Marshall Field & Company at Spray, North Carolina. Early in 1944 they adopted a standard color scheme for painting their plants. This was prepared by H. E. Williams of their engineering department in collaboration with a color consultant and two paint manufacturing companies. Their program was very comprehensive and included not only the use of paint for safety identification, but also standard color schemes for painting the walls and interior of each of their plants and types of operations. At almost the same time, several of the larger paint companies came out with recommendations for the use of colors as an aid in the prevention of accidents but, unfortunately, these recommendations varied from company to company and as a result there was a certain amount of confusion on the part of industrialists when they received information from different paint manufacturers.

This same problem extended into the safety organization of the War Department which realized the value of having a uniform safety color code for use in its various Depots and facilities. Because of its need for a uniform system, the War Department requested that a nationally acceptable standard be developed. In order that this might be available at the earliest possible moment, a project was initiated under the war procedure of the American Standards Association and an American War Standard Safety Color Code for the Marking of Physical Hazards and the Identification of Certain Equipment was approved and published last July 16. This standard designates red to identify (*a*) fire protection equipment and apparatus, (*b*) danger, and (*c*) stop. Yellow is used for caution and the marking of physical hazards; green is used to designate safety and the location of first aid equipment; black and white, or a combination of these two, are used for housekeeping and for traffic markings.

Because of its very recent adoption, it is still too early to measure the real effect of this color code in most of the industrial plants which have now accepted it and put it into practice in their plants.

The adoption and use of such a standard for the prevention of accidents is undoubtedly just as important today as it was during the war period, and it is likely that, in the

near future, a regular peacetime project will be initiated to review the work of the war committee and either reapprove the American War Standard or make improvements and revisions in it.

Under the war project, a subcommittee was formed to prepare technical definitions of the colors mentioned in the standard. For instance, any color may need to have a light limit and a dark limit for the paint and also some limits as to the hue or shade. The members of this group, under the chairmanship of Harry J. Keegan of the National Bureau of Standards have been working now for more than a year on this subject and it is hoped that in the near future they can report on definite recommendations for these colors. They expect eventually to be able to provide a simple table. For each color they will include certain very scientific data on the wavelengths and intensity of light for the color. Then, for the same color, they will give corresponding notations in more familiar terminology such as the Munsell color chart notations or the standard names of the color which have been developed by the National Bureau of Standards. They may even go so far as to refer to certain samples which can be obtained from the Textile Color Card Association in order that the paint company or individual user can actually write in for samples which are commercially available.

The arrival at a technical definition of a color can grow amazingly complicated. The average man gets a very definite conception in his mind when he thinks of red and another very definition conception when he thinks of green. But it is sometimes very hard to bring these conceptions down to technical definitions in order that anyone else may pick up a written document and produce a color from it which will be the same as what the first man had in his mind.

It is reported that about 5 percent of men working in industry are color blind. They have particular difficulty in distinguishing certain reds from certain greens. The subcommittee has made quite a study of this subject and it is hoped that the reds and greens which they pick out will be distinguishable to the majority of color blind people.

One of the most difficult jobs which confronted the war committee on this Safety Color Code was the fact that through past usage there was a confusion in the use of certain colors; for instance, red is used for fire pails and fire extinguishers and, to all intents and purposes, this same red is used for safety cans which may contain gasoline or benzol. As part of this project, a questionnaire canvass was made of industrial users and manufacturers of this equipment to find out if they had experienced any particular difficulty from this confusion. It was surprising that in the replies which resulted there appeared to be practically no confusion between these two uses of the color red. Most of the industrialists replied that the safety cans were of such a distinct shape and size and construction that they were not confused with the fire-extinguishing equipment.

At this point it is only fair to say that the committee which has developed this standard started out with the original premise that fundamentally color should never be used to warn a person of a dangerous condition if there is any possible way to correct the dangerous condition rather than to paint it red. But, from the many reports which we are receiving from industrial users today, there seems to be little doubt that industry would welcome the idea and the benefit of a standard color code whereby all employees will obtain the same concept of color and its meaning. Unquestionably, there is a great deal of work to be done on the correlation of the various uses of color in order that in the future they may be of even more value than in the past for the prevention of accidents.

Army Experiences With Color

(*Continued from page* 165)

section of a warehouse and you have an almost invisible tripping hazard.

Prior to painting the two-inch vertical edges of the trailers and the couplers solid yellow (herringbone stripes were not practical in this case) an average of sixteen tripping injuries per month were attributed to walking into and stumbling over them. The injuries ranged from slightly barked shins to broken arms and legs. Since the color code paint job has been accomplished, not one injury has occurred from a tripping accident of this kind.

Approximately 270 fork lift trucks, plane loaders, and warehouse tractors are used at the Depot to handle the hundreds of thousands of tons of supplies and material stored there. Two problems connected with this mechanical materials-handling equipment caused the Depot safety director to reflect.

This equipment makes considerable noise when being operated; so much so, in fact, that an operator at times cannot hear another machine nearby. This condition on occasion led to collisions. Painting the equipment with four-inch black-and-yellow diagonal herringbone stripes entirely eliminated this type of accident and the resultant damage to equipment.

Fork lift trucks and tractors rolling off the edge of warehouse truck platforms where they were placed for servicing was an even greater headache. The equipment is placed at the edge of these platforms at the close of the workday when operators are fagged and anxious to leave for home; consequently, parking brakes often were not set. When another operator inadvertently released the clutch to start the motor the vehicle would roll from the platform, often injuring the operator and damaging equipment in every case.

This problem was licked by bolting 4- x 4-inch oak guard rails to the edge of the platform, painting them with black-and-yellow herringbone stripes to mark them as a tripping hazard. Several sections of the guard rail were hinged so that they could be raised to permit the handling equipment to enter trucks for loading and unloading. The estimated net saving in property damage alone for one year is $5,000.00.

Many other uses of the color code have been made at the Richmond Depot and in some instances it is not yet possible to evaluate their worth. For example, the absence of fires has not given the uniform use of red for painting fire protection equipment a thorough trial. However, there is no question that the eyes of Depot workers have been trained to look for a large red square on the wall to locate a fire alarm pull box or fire extinguisher.

The employment of white lines to mark warehouse aisles and for road center lines and pedestrian crosswalks cannot be evaluated in dollars and cents or injury terms. The very low motor vehicle accident record of the Depot and the fact that there has been only one vehicle-pedestrian accident in three years indicates that this method of traffic control is of some value.

ASA Safety Committee Acts to Adapt War Standards for Peace

W. R. Smith is re-elected chairman of Safety Code Correlating Committee; F. W. Weber is new vice chairman

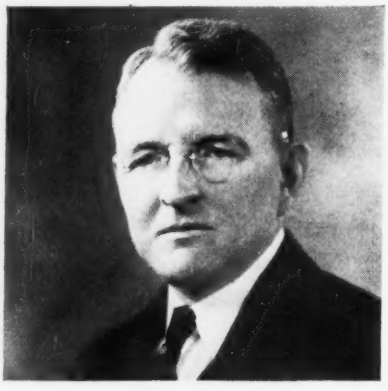
PLANS for making use in peacetime standards of the worthwhile new safety requirements and recommendations adopted in American War Standards were discussed during the annual meeting of the Safety Code Correlating Committee May 7. These plans were, in addition to the election of officers, the main feature of the annual meeting.

It was announced at the meeting that officers were unanimously elected for the coming year.

W. R. Smith, safety engineer, Electric Department, Public Service Electric & Gas Company, representing the Electric Light and Power Group, was re-elected chairman of the committee for the fourth term. F. W. Weber, Western Electric Company, is new vice chairman.

Mr Weber, who is Hazards Engineer, Western Electric Company, has been a member of the Safety Code Correlating Committee since 1944, representing the Telephone Group. He is active in the safety movement as a member of the American Society of Safety Engineers, having been chairman of the New Jersey Chapter in 1941, and member of the National Executive Committee in 1945 and 1946. He is now secretary of the New Jersey section of the American Industrial Hygiene Association. Mr Weber was a member of the American War Standards Committee for Protective Occupational Clothing during the war.

Among the important actions taken by the Committee was a recommendation that a new project for the development of a Safety Code on Manlifts be approved by Standards Council. Because of the unusual dangers involved in the use of manlifts some states have prohibited their use. In other states, however, they are being used in parking garages, grain elevators, and similar storage places. The number of deaths and injuries that have occurred on manlifts has raised the question whether their use should be permitted at all, whether it should be permitted only in certain installations, and, if permitted, what safety measures should be required. It is expected that all these questions will be considered by the sectional committee if the new project is organized.



W. R. Smith

F. W. Weber

Another proposed new project, on ladder towers and rolling scaffolds, was left open for further consideration because discussion during the meeting showed that more far-reaching problems were involved than had been recognized at first. Some further study of the use of ladder towers and rolling scaffolds in mines would have to be made, it was decided, before definite recommendations could be approved as to whether or not such a project should be undertaken.

Standards approved under eight wartime projects were discussed by the committee in relation to their use as peacetime standards. These were the American War Standards for protective lighting, A85; linemen's rubber protective equipment, J6; protective occupational (safety) clothing, L18; toxic dusts and gases, Z37; safety in welding, Z49; safety color code, Z53; industrial use of x-rays, Z54; and safety shoes, Z41. Under these projects, some 51 American War Standards were completed, the protective occupational clothing project covering some 28 standards; safety shoes 9; linemen's rubber protective equipment 5; and concentrations of toxic dusts and gases 5.

As a result of the discussion a study committee was appointed to bring in a recommendation as to whether there is any peacetime value in the American War Standard on protective lighting which was intended to protect against theft and sabotage.

On linemen's rubber protective equipment, the committee tentatively voted to organize a sectional committee to consider peacetime standards. However, further study is being given to this subject in the light of suggestions that the American War Standards be turned over to the American Society for Testing Materials for consideration.

A vote is now being taken of the Safety Code Correlating Committee on the tentative recommendation made at the meeting that a sectional committee be organized to prepare peacetime standards for safety clothing and that the Industrial Safety Equipment Association be considered as sponsor.

A new project has already been initiated for the development of peacetime standards on safety in welding, and for the consideration of the American War Standard in this connection.

The five American War Standards on Allowable Concentrations of Toxic Dusts and Gases, Z37, have been referred to the already existing peacetime project. These war standards cover cadmium, manganese, metallic arsenic and arsenic trioxide, xylene, and styrene nomoner.

A letter ballot vote is being taken of the entire Safety Code Correlating Committee to give official approval to initiation of peacetime projects on the safety color code and on industrial use of x-rays. Members of the Committee who were present at the

annual meeting voted that the National Safety Council be invited to serve as sponsor for the proposed new project on the Safety Color Code and the National Bureau of Standards on the industrial use of x-rays.

The American War Standards on safety shoes are already being considered under the already existing peacetime project. The sectional committee has been reorganized with the National Safety Council as sponsor.

Standardization of Batteries For Personal Planes

The development of lower-cost, higher-performance batteries for personal planes is the aim of the latest project assigned by the National Aircraft Standards Committee, an activity of the Aircraft Industries Association.

This move to develop standard specifications for personal aircraft batteries results from an extensive study of the light plane standardization field conducted for NASC by Taylorcraft Aviation, Alliance, Ohio. The battery project has been assigned to the Cessna Aircraft Company, Wichita, Kansas, which will confine its initial efforts to location of terminals, mounting connections, and dimensions. Once these have been established, development of procurement specifications will be considered. The Cessna Company will work with the battery manufacturers' standardization body and other interested technical organizations.

ASTM Opens New Offices

New and larger offices at 1916 Race Street, Philadelphia 3, Pa., have been acquired for the American Society for Testing Materials which for many years occupied a site at 260 South Broad Street in the same city.

Contributions from various companies and individuals active in the Society's work have made the purchase possible at a time when additional space is badly needed to care for a rapidly increasing staff. The technical work in which ASTM has concentrated its activities since 1898 (the development of standard specifications and tests for materials, and the promotion of knowledge of properties of materials through research) has expanded rapidly during the past few years. As a result, ASTM leaders have for some time hoped for the opportunity to obtain a permanent location with space for expansion.

While alterations will not be fully completed until fall, sufficient progress has been made to enable the staff to move into its new quarters. The new location is on Philadelphia's Parkway, adjacent to the Academy of Natural Sciences and close to the Franklin Institute and the main Philadelphia Free Library.

New Committee Brings Together Commerce Department and ASA

AS suggested by Secretary of Commerce Henry A. Wallace in his letter to Charles E. Wilson, chairman of the Policy Committee on Standards,[1] a joint conference committee of the American Standards Association and the Department of Commerce has been organized "to promote the wider use of voluntary standards and their adoption to the needs of the nation's commerce in the postwar years".

It is intended that this committee will consider the entire field of standards from the points of view of the Department and the American Standards Association—the scientific, technical, and testing aspects as well as the economic, marketing, and trade aspects of the problem. For this reason the committee is composed of the following representatives:

Department of Commerce

Edward U. Condon, Director, National Bureau of Standards
Philip M. Hauser, Director, Office of Program Planning
Harold Young, Solicitor

An additional representative is to be appointed by the Department to fill a vacancy due to the fact that General Albert J. Browning, Director, Office of Domestic Commerce, who was originally a member of the committee, has left the Department.

American Standards Association

Howard Coonley, Chairman, Executive Committee
H. S. Osborne, Past Chairman, Standards Council; member, Board of Directors
P. G. Agnew, Vice President and Secretary
Cyril Ainsworth, Technical Director and Assistant Secretary

At the first meeting held in Washington in April, it was agreed that the Department of Commerce and the ASA should cooperate in the development of a national program which will bring the widest benefits in the shortest period of time. The ASA, therefore, has been requested to present some concrete proposals as to how the Department can help to further the standardization program.

[1] INDUSTRIAL STANDARDIZATION, April 1946, pp 65-67.

National Fire Protection Association Celebrates Fiftieth Anniversary

FIFTY years of increasingly effective work in the prevention of fire hazards was celebrated by the National Fire Protection Association June 3-7 at its Fiftieth Annual Meeting. From a small group of public-spirited New Englanders who met for the first time in a Boston office in 1896, the Association has grown in the past 50 years into an organization of world renown, with 150 national organizations and more than 10,000 individuals as members in 37 countries.

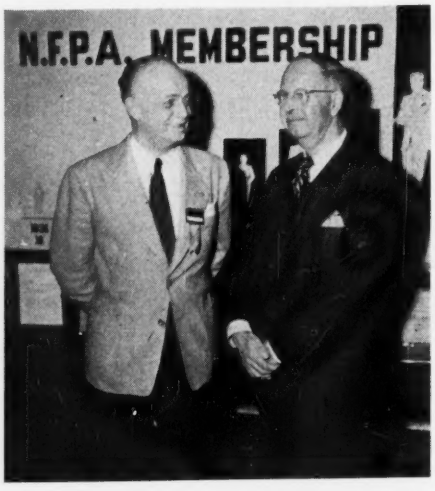
As a result of its 50 years of fire-prevention work, the NFPA is recognized throughout the world as the international clearing house for authoritative information on fire prevention and fire protection, issuing and distributing from 5,000,000 to 10,000,000 copies of its publications a year.

The development of standards to guide companies and communities, as well as individuals, in the prevention and control of fire is one of the important activities of the Association. Nearly 150 technical standards have already been completed by committees of the NFPA. Several of these committees have been approved as sectional committees of the American Standards Association and standards developed by them have been approved as American Standards. Some of the projects for which the NFPA is sponsor under the procedure of the American Standards Association include the prevention of dust explosion hazards, the Building Exits Code, the new safety code for grandstands, tents, and places of outdoor assembly, and fire protection for blower and exhaust systems.

In addition to its work on standards, the NFPA brings together the groups concerned in each phase of fire fighting and fire prevention to exchange information and develop new techniques to take advantage of the most up-to-date material available for the control and prevention of fire. Through its field service it keeps direct contact with states, provinces, and cities throughout the United States and Canada. This work is carried on by three important sections, the fire marshal section, the marine section, and the railroad section. The fire marshal section was formed when the Fire Marshals Association of North America in 1927 petitioned the NFPA to accept their organization as a section.

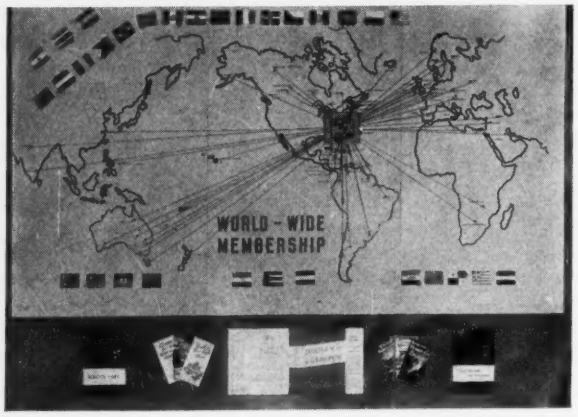
In 1933 an important move was made by the Association to reach the small communities which are served by volunteer fire departments through establishment of the *Volunteer Firemen Magazine* (now *Firemen*). There are now more than 20,000 volunteer firemen affiliated with the volunteer fire company section of the Association.

Perhaps more than anything else, the work that the NFPA did during the war proved the effectiveness of its organization and showed how thorough its technical program has been. During World War II fire was used extensively as an important weapon and the experience of the NFPA in fighting fire was found to be useful in reverse as a weapon of offensive warfare. When President Roosevelt created the United States Strategic Bombing Survey in 1945, the chief engineer of the NFPA was asked to handle fire damage analysis for the physical damage division. When the Undersecretary of War created a five-man advisory board on fire protection, the NFPA general manager was the only civilian member. Percy Bugbee, general manager of the NFPA, was chairman of the industrial protection committee organized by the United States Office of Civilian Defense. The NFPA also served as adviser in Navy and Coast Guard fire control programs. R. S. Moulton, technical secretary of the Association, served as fire adviser to the War Production Board and throughout the war the staff of the Association served as informal consultants to the National Housing Agency and Federal Public Housing Authority.



Richard E. Vernor, retiring president of NFPA (left); Curtis Pierce, newly elected NFPA president (right).

Internationally prominent speakers who addressed the Fiftieth Annual Meeting included Karl T. Compton, president of the Massachusetts Institute of Technology, who was appointed recently by the President as a member of the Atomic Bomb Commission, and Sir Aylmer Firebrace of London, England, Chief of Fire Staff, British National Fire Service.



NFPA membership now extends to all parts of the world. 150 national organizations and more than 10,000 individuals are members in 37 countries.

NFPA committees, which are now resuming their peacetime work, reported to the meeting on the standards they are preparing. Some of the important work now going forward

includes a revision of the NFPA Standards on Flammable Liquids which proposes important changes in the requirements for safeguarding gasoline and oil tanks; new standards on general storage to cover warehousing of all kinds, and special standards for fur storage; complete new standards for the safeguarding of liquefied petroleum gas systems (propane and butane); new requirements governing the installation of preaction and deluge sprinkler systems; revised standards on gas systems for welding and cutting including acetylene and other gases.

The American Standards Association expressed its appreciation of the good work done by the NFPA in its first 50 years in the following telegram:

"Congratulations on your half century of outstanding services to the American people. We in the American Standards Association wish you equal success in your future activities and hope that the cooperation between our two organizations may continue to grow in scope and usefulness."

Howard Coonley Receives War Department Decoration

One of the nation's highest honors has gone to Howard Coonley, chairman of ASA's Executive Committee, for outstanding wartime service overseas. On Friday, May 23, General R. H. Young, Area Commander in Washington, presented Mr Coonley with the MEDAL OF FREEDOM. As Donald Nelson's Deputy, Mr Coonley organized the China War Production Board and guided Generalissimo Chiang Kai-shek and other leaders of China in developing a more effective industrial war machine.

His conspicuous devotion to duty and his remarkable achievements are borne out by this citation of the War Department:

"Mr Howard Coonley, American Civilian, as Deputy in Charge of the American War Production Mission in China from November 1944 to March 1945 was largely instrumental in setting up the organic law and divisional structure of the China War Production Board. He subsequently ably assisted it in carrying out its mission. His constructive help and guidance to China's industry was reflected in better industrial organization, increased production of munitions, improved quality of product, and higher efficiency of operation."

Board of Directors Enlarged; Three New Members Named

THE personnel of the ASA Board of Directors has been enlarged as a result of the recent election of three new members. Roger E. Gay, president of the Bristol Brass Corporation, was nominated by the Copper and Brass Research Association; and Mrs Guy Moffett and Max Gertz are members-at-large.

Although new to the organization of the American Standards Association, Mr Gay is a familiar figure in the brass industry, having been connected with many phases of its activity. His most fundamental ties are those with the Bristol Brass Corporation of which he is president. This position was preceded by his association with the American Brass Company as assistant sales manager, and again with the Bristol Brass Corporation as vice president until 1943. At present he serves as a director in the Bristol Traction Company, the Bristol Brass Corporation, and the Whitney Chain and Manufacturing Company. Mr Gay is also chairman of the Brass Mill Industry Advisory Committee of the OPA.

Mrs Guy Moffett has long been active in the consumer goods field. Her interest in standards dates from 1933 when she originated the Better Buymanship bulletins for Household Finance Corporation. Since that time, she has done extensive writing on many aspects of the consumer problem. Most important were her contributions to the *Journal of Home Economics*, the Public Affairs Committee, Inc, and the Bureau of Home Economics of the U. S. Department of Agriculture. In addition to being chairman of the teacher-retailer committee of the National Consumer-Retailer Council, Inc during 1945, she is also a member of the American Home Economics Association, American Association of University Women, and League of Women Voters.

Despite these numerous enterprises, Mrs Moffett has still found time to direct much of her energy toward the ASA. From 1941 to 1943 she served as vice chairman of the Advisory Committee on Ultimate Consumer Goods, and she is also an enthusiastic participant on the ASA sectional committees on Specifications for Refrigerators, B38; Standards for Bedding and Upholstery, L12; and Performance Requirements for Protective Occupational Footwear, Z41.

Mr Gertz is vice president and general merchandise manager of B. Gertz, Inc, one of Long Island's largest department stores. As a member of the National Retail Dry Goods Association, he has long represented that organization on the ASA Advisory Committee on Ultimate Consumer Goods, taking an active part in its early formation and serving as a past chairman of the committee. He was price coordinator of the Queens County OPA in 1942-43 and treasurer of the National Consumer-Retailer Council.

Roger E. Gay

Max Gertz

The Background—

IN July 1941, the Company Member Forum of the American Standards Association discussed in detail the variety of steel specifications that was causing delay and confusion in building up supplies for our own Army and Navy as well as in providing needed materiel to Great Britain and Russia. The principal steel specifications in use in this country included those developed by the American Society for Testing Materials, the Society of Automotive Engineers, the American Iron and Steel Institute, the Navy Department, the War Department, and the Federal Specifications Board. This variety was confusing not only to Government purchasing officers but also to the fabricators who had to follow Government specifications, the Forum discovered. To help in eliminating the cause of the trouble, the Forum organized a subcommittee to formulate a definite plan for the comparison and coordination of steel specifications. However, because of the urgency of the problem, the increasing difficulty of obtaining the materials called for in the specifications, and the consequent need for using substitutes, the Office of Production Management asked the American Society for Testing Materials, the Society of Automotive Engineers, and the American Iron and Steel Institute to carry out a project to select the minimum number of steel specifications, compositions, and sections necessary to meet the requirements of national defense. This project was carried out in collaboration with the War and Navy Departments, under the general supervision of the OPM. C. L. Warwick, secretary-treasurer of the ASTM, who was at that time Consultant to the Office of Production Management, headed the Administrative Committee which directed the work.

A classification of steel products prepared by the ASA Company Member Forum subcommittee was turned over to the OPM project for its use. The National Emergency Steel Specifications, so widely used during the war, were the result of this OPM (later WPB) work.

Now again the question of whether a single specification system with uniform designations should be prepared for all materials is under discussion. A Symposium published in the March 1946 issue of Machine Design *raises the question "Should a single materials specification system be established?" The question whether the varied materials specification systems of today will promote increased efficiency or increased confusion during the vital years of industrial expansion that lie ahead is a question of primary importance to every engineer in the country,* Machine Design *explains.*

Because of the importance of this question, INDUSTRIAL STANDARDIZATION *is pleased to reprint this symposium by special permission of* Machine Design. *Comments and suggestions will be welcomed by the American Standards Association.*

Should a Single Materials Specific

A Symposium Reprinted from Machine Design, *March 1946*

Will the varied materials specification systems of today promote increased efficiency, or increased confusion, during the vital years of further industrial expansion that lie ahead? This is a question of primary importance to every engineer in the country.

Before it can be answered competently, many influencing factors, which in themselves take the form of questions, must be given serious consideration. Among these are: Should an over-all engineering society board be organized for coordination of materials specification methods as well as for initiating and promoting other standardization work? Should a Government agency head up such activity? Do requirements peculiar to the various industries differ to such a degree that it would be inadvisable to reduce the number of specification systems?

To help clarify this inherently controversial matter, and to aid in crystallizing ideas pertaining to it, ***Machine Design*** has thrown open its pages for discussion by competent engineers representative of the machine-building field. The considered opinions of a number of these engineers are presented on the following pages.

ecfication System Be Established?

. . . definite need . . . not under Government control

By George H. Harnden

Head of Specifications and Technical Data Section of Works Laboratory, General Electric Company, Schenectady, N.Y.

WITH THE growing interest in material standards by all branches of industry it becomes very necessary that there be established a single system of material specifications. World War II focused attention on the nonuniformity existing in the materials specification field. Manufacturers of equipment for the armed forces were forced to work to as many as six or more different specifications covering the same raw material, depending upon the bureau from which the contract emanated. Many specifications were prepared in close cooperation with the manufacturers of the raw materials, while the emergency situation required the immediate issuance of others which were based on the best published information or on first-hand test data, with questions being asked later. This led to many differences in specifications for the same material, some of major importance, others of a minor nature, all of which, however, were an annoyance to an apparatus or machine manufacturer in trying to employ standard or commercial materials to expedite manufacture.

Many companies have their own specification-writing groups. Specifications on raw materials emanating from such groups generally are based on commercially standard materials of industry, insofar as the engineering design of the apparatus for which it is used will allow. These specifications are prepared, generally, with the assistance of the manufacturers of the raw material after a study is made of existing specifications on the same subject. A single materials specification system would materially aid such specification-writing groups.

Many associations and societies, such as engineering, manufacturers, etc, prepare specifications. Usually, in each case, they look no farther than their own particular need and the result is another specification on the same material. No attempt is made in most cases to coordinate this work with that of other groups working with identical materials on similar problems.

There is a definite need for further standardization insofar as this is practical. It must, however, be on a voluntary and cooperative basis; cooperative not only from the standpoint of the manufacturers of the materials in question, but also on the part of the users, the various engineering societies, and the manufacturers associations. Each must become imbued with the spirit of give and take. They must put aside their so-called "prerogatives" and be prepared to work together with an open mind. This means that manufacturers of materials must be willing to get together with specification-writing groups and give all the information on their respective products necessary for an engineering standard. This would not require manufacturers to divulge information on the "know how" or that "inherent quality" which each puts into his product and is his stock in trade. It would mean that engineering societies, manufacturers associations, and similar groups be prepared to exchange engineering information, test data, and drafts of proposed material specifications so that they could be coordinated. It would mean that consumers make every effort to use standardized materials by proper educational programs among their engineering divisions, the setting up of proper internal standards, participation in standardizing societies and programs, and frequent round-table discussions with the manufacturers of the various materials.

This standardization should take the form of standard specifications on raw materials of all kinds, types, grades, etc, standard procedures or methods of test for determining properties of materials in accordance with the specifications, standard dimensions, sizes, threads, colors, etc, and standards on commercial sizes available, preferably on the basis of the preferred-numbers system.

This work should not be centered around nor undertaken by any of the specifications committees of the various government bureaus, including the National Bureau of Standards, or by any other existing or planned government agency. Obviously, government bureaus should be represented but should not control this work; otherwise the freedom and flexibility would be lost. It should be kept on a voluntary basis, and in the hands of an unbiased, free-thinking and well-balanced group of representatives of the consumer and manufacturing industries, as well as the engineering societies and the manufacturers associations.

. . . makes sense, with superimposed requirements

By H. W. Gillett

Technical Adviser, Battelle Memorial Institute, Columbus

IT is neither practical nor desirable to have but one set of detailed specifications. In steels, for example, the automotive engineers found it worthwhile to pay for closer limits on carbon than are practical in a general specification, in order to simplify heat treatment for continuous rather than batch operation.

In the present period of transition from specifications for composition to those for properties, it is difficult to set up a single specification without yielding to the temptation to include both; whereas, a specification for properties ought to keep very silent as to composition.

When properties are specified, the end use should be considered. For example, if low-temperature notched-bar toughness is required, testing and selection of heats are required, since different heats have "individuality" in this respect. Thus, a low-temperature requirement may be added to a basic specification when necessary, but it would be out of place in steel for a product not for low-temperature use.

One basic specification, upon

which other requirements are superimposed when—and only when—needed, makes sense.

There is, however, no excuse for one irritating situation. The numbering system for steels, started by the SAE, which acts as shorthand to show both the type and the carbon content, is so useful that it remains in most of the various specifications, but the Aeronautical Materials Specifications introduce other numbers which are without such meaning, and which in certain cases are confusing. For example, AMS 6352 is AISI 4130, AMS 5120 is sheet spring stock of AISI 1070, while AISI 5120 is a 0.20 carbon-0.80 percent chrome steel. We have met cases where subcontractors were badly confused by this usage, and work was held up while they tried to find out what steel was actually called for.

. . . single system not justified nor desirable

By Wm. T. Schwendler

Vice President and Chief Engineer, Grumman Aircraft Engineering Corporation, Bethpage, Long Island, N. Y.

THE aircraft industry already has accomplished a single materials specification system through the establishment of Army-Navy-Aeronautical specifications for all the commonly used materials in airframe construction. These specifications have supplanted Army, Army Air Forces, Navy, Federal, and commercial specifications. Their usefulness has been such that they will continue to be used by most manufacturers for commercial as well as military aircraft.

To many producers of material these AN specifications may appear unnecessarily rigid. Past experience, however, has shown their special requirements to be necessary. These requirements, while adding to the cost of the material, allow the use of small design margins with an appreciable saving in weight. The material cost in a finished airplane is a much smaller percentage of the total cost than that expended for labor. Therefore, the additional cost of a rigidly inspected and high-quality material is generally offset by a saving in rejections of finished or semifinished parts.

In industries where weight is not at such a premium, generous design margins may be allowed for inconsistencies in the material and for defects which would make the material unsuitable for aircraft use. This allows the use of material made to quite liberal specifications with resultant lowered material costs. In an industry where material is a greater percentage of the finished cost than for aircraft, the use of "aircraft quality" material cannot be economically justified. It also follows that different industries can tolerate various qualities of material so that several qualities may be justified for each material used by several different industries.

It is, therefore, believed that a single materials specification system is not justified nor desirable. Elimination of duplication and overlapping of specifications is very worthwhile, however, and effort should be made toward accomplishing this end.

. . . no project more important in standardization field

By Thomas Spooner

Manager, Engineering Laboratories and Standards Department, Westinghouse Electric Corporation, East Pittsburgh, Pa.

WE ARE HAPPY to offer our comments with reference to a national unification of material specifications. In the standardization field we know of no project which is more important.

The table on page 175 gives a picture of the multiplicity of the principal agencies in this country which are active in the preparation and distribution of materials standards.

In addition to much duplication there are too many grades differing in composition by insignificant amounts. In the metals field, both ferrous and nonferrous, the situation is particularly bad. This condition was fully realized before Pearl Harbor and steps were taken, under the sponsorship of the ASA, to correct or at least improve the situation. However, due to the war and the enormous requirements of the armed forces, the specifying of materials was centered largely in Washington, with the WPB taking a large part. Immediately expediency governed and new war groups entered the field with still further duplication and complication. Cost and efficiency were ignored. With the war over

Fig. 1—Is there actually a need for the many different specifications which cover identical or closely similar materials, as shown below? This reproduced chart is but a small portion of the Cross-Index of Chemically Equivalent Specifications published and distributed by the General Motors Corporation.

Code No.	Specification	Material & Form	Source	Copper Min-Max	Zinc Min-Max	Tin Min-Max	Lead Min-Max	Antimony Min-Max	Iron Min-Max	Phosphorus Min-Max	Min-Max	Min-Max	Other
10065	57-172-1D	Sheet & Strip	A	68.5–71.5	Rem		0.07		0.05		(0.006 Bi,0.0	001Hg,0.15	Other Max)
	47B4	Sheet & Strip	N	68.5–71.5	Rem		0.07		0.05		(0.006 Bi,0.0	001Hg,0.15	Other Max)
	JAN-B-50	Sheet & Strip	J	68.5–71.5	Rem		0.07		0.05		(0.006 Bi,0.0	001Hg,0.15	Other Max)
	O.S. 1331	Sheet & Strip	N	68.5–71.5	Rem		0.07		0.05		(0.006 Bi,0.0	001Hg,0.15	Other Max)
	SAE-70, Gr A	Sheet & Strip	S	68.5–71.5	Rem		0.05		0.05				
	B36-44T, Alloy 6	Sheet & Strip	T	68.5–71.5	Rem		0.05		0.05				
	B19-44T	Sheet & Strip	T	68.5–71.5	Rem		0.07		0.05		(Cu +Zn –	99.85 Min)	
	AMS-4505A	Sheet & Strip	M	68.5–71.5	Rem		0.05		0.05				
	57-173C	Cart Brass	A	68.5–71.5	Rem		0.07		0.05				0.15 Total
	B129-44T	Cart Cups	T	68.5–71.5	Rem		0.07		0.05		(Cu +Zn –	99.85 Min)	
	57-172-2C	Cart Cups	A		(Analysis C	overed by	57-172-1D)						
	O.S. 1051	Cart Disks	N	68.0–71.0	Rem		0.07		0.05				0.15 Total
	QQ-B-611a, Comp E	Wrought Alloy	F	68.5–71.5	Rem		0.07 ·		0.04				
	SAE-74, Alloy C	Tubing	S	68 5–71.5	Rem		0.10		0.07				
	B135-43T, Alloy 2	Tubing	T	68.5–71.5	Rem		0.075		0.06				
	B14-18	Tubes—Boiler	T	69.0	Rem		0.50		0.10				0.50 Total
	AMS-4555	Tubing	M	65.0–71.5	Rem	.15	0.80		0.08				
	QQ-W-321, Gr C	Wire	F	69.0–74.0	Rem		0.075		0.06				
	B134-44T, Alloy 6	Wire	T	68.5–71.5	Rem		0.07		0.05				
	QQ-S-551, Comp C	Solder	F	68.0–72.0	Rem	None	0.30		0.10				
	46S15a, Gr C	Solder	N	68.0–72.0	Rem		0.30		0.10				

and the cost of materials and labor rapidly rising, efficiency must once again come to the fore.

It is time that industry carried the ball once more with, it is hoped, full cooperation of the government agencies. The Standards Branch of the Procurement Division of the Treasury Department, under the able leadership of Willis S. MacLeod, is already attempting to coordinate the government agencies.

Society or Standardizing Bodies	Comparable Spec No.
Society of Automotive Engineers	1035
Aeronautical Materials Specs (SAE sponsored)	AMS 5060
American Society for Testing Materials	A-107
American Bureau of Shipping Reference: ABS Stds Sect 40, ref (a), Properties Listed	
American Society of Mechanical Engineers	S6
American Iron and Steel Institute	C1035
American Standards Association	G43.1
Government Agencies	
U.S. Navy	51D6
U.S. Army	100-17
War Dept	WD-035
Army-Navy	AN-QQ-S-646
Federal	QQ-S-646
Etc, (such as Signal Corps, Ordnance)	
Signal Corps	71-2202
Ordnance	AXS 1084

We believe it is not the function of manufacturers of materials or even their trade organizations to prepare specifications and assign designations. This should rather be the function of impartial associations made up of users, producers, and general interest groups. We believe that of the available agencies the ASA, due to wide membership and suitable procedure methods, is best qualified to do this job.

Just before the war intervened, an ASA committee, under the chairmanship of R. A. Frye of the Westinghouse Electric Corporation, was organized to review and coordinate the existing steel specifications. There was also authorized the formation of two other committees to function similarly for aluminum alloys and for the other nonferrous metals. However, for the reasons indicated above, these projects were indefinitely postponed. We believe it is now time that they be reviewed and pushed actively to a conclusion. We hope that *Machine Design* agrees and will help in this most urgent coordination project of unification of material specifications.

. . . do not believe would serve any good purpose

By Karl D. Williams

Chief Engineer, Materials, Navy Department, Bureau of Ships, Washington, D. C.

SPECIFICATIONS are prepared for several reasons. First, to detail the characteristics of a material for the designer or user; secondly, to describe to the purchaser the material desired; thirdly, to inform the bidder and contractor regarding just what is required in filling the contract or purchase order and, lastly, to describe just what inspection and tests are to be made to insure the delivery of material complying with requirements. No specification can be considered complete unless it provides for each of these points.

Specifications differ from standards in that their requirements are generally based on the end use of the products covered thereby. For example, since the end use of a product on shore and on board ship may not be the same, specification for the product may of necessity differ.

Progress in the development of materials is made through specifications. If standards are strictly adhered to, advancement is retarded or ceases altogether.

In view of the foregoing, it is not believed that any good purpose would be served by the establishment of a single materials specification system since each activity using the product covered by a specification should have control in order to insure provisions in the specification for its requirements.

It is believed every effort should be made to establish "standards", not "specifications", for the chemical properties of alloys and for dimensions and designs of products. Such standards should be promulgated, if practicable, by a single agency to the satisfaction of all other interested agencies.

These opinions or assertions are the private ones of the writer and are not to be construed as official or revealing the views of the Navy Department or the naval service at large.

. . . would be welcomed by steel foundrymen

By Charles W. Briggs

Technical and Research Director, Steel Founders' Society of America, Cleveland

I AM VERY much in favor of the establishment by one specifying body of a universal set of specifications applying to a single product. I know, from my association with the steel casting industry, that steel foundrymen would welcome one complete set of steel casting specifications which would be used by all purchasers of steel castings. The Steel Founders' Society has for a number of years taken the stand that the steel casting specifications of the American Society for Testing Materials should constitute the only authorized specifications for cast steels and steel castings.

Surely if all buyers and producers of a product would get together to produce a complete set of specifications for all uses of the product, there would be produced acceptable specications for all.

Personally, I prefer the American Society of Testing Materials' approach to the specification problem, since both users and producers of a product collaborate in the preparation of specifications. Also, there are a sufficient number of general-interest members available to assist in producing the proper solution in case of failure of the user and producer to get together on a subject.

If every one knew that, for example, he could go to the ASTM standards for all cast steel specifications, I believe that there would be fewer private specifications and the foundries would know more about producing castings to the desired requirements.

One of the greatest drawbacks to a single agency's preparing specifications for a product is the Government purchasing bodies. The Government departments seldom use specifications prepared by bodies other than their own; hence it would be nigh impossible for Government departments to accept as purchase requirements, specifications that had been prepared, for example, by the ASTM. In fact, it is very doubtful if they would prepare a specification for Government use that was identical to the requirements of the designated specifying body. In view of this situation, it appears that if a single set of speci-

fications were prepared, the Government would be the body that must issue such specifications.

If such procedure were to be followed, it would be advisable for Government to change its procedure in the preparation of specifications so that other users and all producers of a material could have a voice in the preparation of the specifications. Also, specifications for the complete range of products must be prepared, and not just for those products normally used by the Government departments.

One of the disadvantages of present Government specifications is that for a single product, each of four or five Government departments prepare specifications. For instance, steel casting specifications have been prepared by the Navy Department, War Department, Coast Guard, Bureau of Navigation and Steamboat Inspection of the Department of Commerce. These requirements are in addition to the Federal Specifications for Steel Castings. It would seem that the Government itself has a job to do in preparing a single set of specifications.

The solution to the problem is a difficult one. Perhaps it would be wise to instigate two specification-writing bodies for a single product: (1) The Government, and (2) a single designated body. The latter could be arranged by mutual agreement of all scientific societies and trade associations interested in the manufacture and purchase of the product. It should be the understanding that any organization or any company could request the preparation of new specifications or the revision of standard specifications. The specifications prepared should be given wide publicity so as to prevent the preparation of private specifications.

. . . desirable . . . but realization would be miracle

By G. K. Eggleston

Vice President in Charge of Engineering, Barnes Manufacturing Company, Mansfield, O.

THE confusion caused by multiplicity of specifications on like or similar materials during the war period is still very fresh in my mind. Even more exasperating were some of the interpretations made of poorly worded specifications by people not qualified to make interpretations. While I have been exposed to specifications of wide variety, the bulk of them have applied to metals, the copper-base alloy castings in particular. In view of this, the following remarks will be confined to specifications covering brass and bronze castings.

As a basic principle, I believe a single materials specification system is very desirable. But its realization in our time would be a miracle. I believe all the specification-writing institutions would agree to the single system provided it was theirs.

The part of like or similar specifications that apply to the chemical composition of a brass or bronze has been fairly well standardized. Because of this, it is reasonably simple to obtain basic materials of proper chemical composition and to produce castings therefrom of the desired composition. But your troubles start when you try to follow the whims and brain storms of how the physical properties of the resulting castings are to be obtained.

It might be possible to write a specification covering the physical properties of a given casting alloy for a specific or limited field of use. But some common alloys such as the well-known 85-5-5-5 have an extremely wide field of use, all the way from castings that must withstand high hydraulic or pneumatic pressure to those used only for ornamental purposes.

This leaves the choice of writing a series of specifications for the same alloy covering a series of specific uses, or a single specification broad enough to cover the whole field of uses. The use of these broad specifications is very liable to increase the cost of castings by unnecessary tests, when the use of the casting does not indicate that such tests are needed.

I would be a little afraid to put a broad type of specification in the hands of an Armed Services inspector because if the designer of the piece had not specifically indicated which parts of the specification did not apply, you would probably find yourself having to do everything that was written into the specification, whether it made sense or not. I think I can best illustrate this by quoting a Navy Inspector's Creed, with apologies to

Fig. 2—An over-all specification system might be developed similar to that recently adopted for plastics molding materials by the Society of the Plastics Industry, Inc. A sample of the new plastics classification is shown below. In this system, grade numbers indicate the basic properties, and suffix letters (M, E, O, T, C, and A) indicate the additional properties that are required.

GRADE NUMBER	BASIC REQUIREMENTS					REQUIREMENTS								
						SOURCE OF SPECIFICATION				MECHANICAL PROPERTIES				
	Heat Distortion Temp °F 264 PSI Fiber Stress ASTM D648-41T	Impact Strength Izod Ft-lb per in. notch ASTM D256-43T	Tensile Strength PSI ASTM D638-42T (3) D638-44T (3) D651-44T (4)	Maximum Continuous Service Temp °F (2)	Heat Distortion Temp °F 66 PSI Fiber Stress ASTM D648-44T	Material Basic Chemical Analysis (1)	American Society for Testing Materials	Federal	Joint Army-Navy (JAN)	Flexural Strength PSI Fed Spec 1031 ASTM D650-42T ASTM D48-43T (5)	Compressive Strength PSI ASTM D695-42T ASTM D649-42T (6)	Modulus of Elasticity in Tension PSIx10^6 (7)	Hardness Rockwell (8)	Specific Gravity ASTM D792-44T (10)
	MIN	MIN	MIN	MAX	MIN					MIN	MIN	MIN	MIN	MAX
						X	Sa	Sb	Sc	Ma	Mb	Mc	Md	Mf
SPI 10232	100	2.3	2000		140	CAB	D707-7							1.19
SPI 10252	100	2.5	2000		130	CAB	D707-10			3200				1.21
SPI 10302	100	3.0	2000		120	CA	D706-11							1.32
SPI 10311	100	3.1	1000		130	CAB	D707-8			1600				1.18

Tennyson: "Ours is not to reason why, ours is but to do and die."

. . . why not adopt a modified SAE system?

By A. O. Wood

Chief Engineer, Tocco Division, The Ohio Crankshaft Company, Cleveland

WE HAVE felt for some time that steel specifications are becoming increasingly involved and a simplified single specification would be welcome. There is, in many cases, not only an overlap between several systems such as AISI and SAE, but also there are too many divisions within any one system. These two specifications could be simplified, and the Air, Army, and Navy could be brought in with AMS for high quality work. In addition to the chemistry, these specifications, as with ASTM, cover the quality, inclusions, finish, etc.

Why not group all under a modified SAE system as regards chemistry, and where further specifications as to quality are to be made, use a prefix or suffix to indicate it? Then the type of steel as well as its quality could be readily recognized.

. . . committees should decide on a single system

By B. F. Jones

Assistant Chief Engineer, The White Motor Company, Cleveland

IN GIVING careful consideration to this question, the first point to be definitely established is the use of the word "materials". Every industry using various types of materials has its own specifications or has adopted some of the standard specifications now existent. In order to properly evaluate the answer to this question, we believe that it should be confined to a certain class of materials, such as steels.

From the writer's experience, we feel that the SAE material specifications for steels are the most complete and comprehensive and are used largely throughout the manufacturing industries at the present time. As evidence of this fact, the writer served on several War Engineering Boards to establish certain specifications, and in nearly every instance the SAE steel specification was used as the basis for compiling various comparative data.

SAE and AISI specifications, of course, follow the same basic numbering system. For example, a plain carbon steel with 45 points of carbon is designated in the SAE list as SAE 1045 steel; in the AISI specifications it is designated C1045. This same similarity follows through the alloy steel range.

Army, Navy, and Federal specifications are based on the same series of symbols which indicate definitely the type of steel by a designated number. It seems that the specifications for steels have been standardized to a greater degree than many other specifications, and we believe that in order to properly evaluate specifications, representatives of the various interested manufacturing groups should form co-operative committees to decide upon a single standard. This type of work is now being carried on by the SAE, which is represented by committee members working with other technical societies and associations, such as the ASTM, American Standards Association, Federal Specification Board, Radio Manufacturers Association, and American Petroleum Institute.

. . . technical societies must be closely co-ordinated

By Charles D. Townsend

Plant Engineer, The S. K. Wellman Company, Cleveland

THE present varied system of specifications for materials has become extremely cumbersome. The Army, Navy, Aeronautical and Federal, as well as the National Emergency Specifications, were expanded during the war to the extent that every industry was required to purchase raw materials to at least one, if not all, of these specifications. Overlapping and yet different requirements within these specifications caused considerable difficulty in producing the same part for more than one branch of the armed forces.

With the return to normal production these specifications, plus the previous AISI, SAE, and ASTM specifications, tend to produce a condition that is difficult to co-ordinate. All are basically similar and vary only in a minor degree on some one item that is considered vital to that industry served by the specification. Prior to the war, each industry knew only of the specifications for that industry and rarely realized how nearly alike the other standards were for the same product. Due to the war, many industries have learned of these different specifications and have become confused as to the actual need for so many.

Establishment of a single materials

ADDED BY SUFFIX LETTERS

ELECTRICAL PROPERTIES										OPTICAL PROP			THERMAL PROP		CHEM PROP	AGING PROP		GRADE NUMBER
Power Factor			Dielectric Constant			Dielectric Strength Volts per Mil		Volume Resistivity Meg-Ohms cm	Resistance			Index of Refraction	Light Trans %	Haze %	Coefficient of Thermal Expansion Linear in/in/°C x10⁻⁵	Rate of Burning	Water Absorption % Net Gain	Weight Loss %	Dimension Change %	
ASTM D150-42T			ASTM D150-42T			ASTM	D149-44T		Insulation Meg-Ohms	Arc Sec									
Cycles			Cycles																
60	10^3	10^6	60	10^3	10^6	Short Time	Step by Step	ASTM D257-38	ASTM D257-38	ASTM D495-42T		ASTM D542-43T	ASTM D672-43T	ASTM D672-45T	(9)	ASTM D635	ASTM D570-42T	(11)	(12)	
MAX	MAX	MAX	MAX	MAX	MAX	MIN	MIN	MIN	MIN	MIN		MIN	MIN	MAX	MAX	MAX	MAX	MAX	MAX	
Ea	Eb	Ec	Ed	Ee	Ef	Eg	Eh	Ei	Ej	Ek		Oa	Ob	Oc	Ta	Tb	Ca	Aa	Ab	
						250						1.46	80				1.60	2.4		SPI 10232
						250											1.30	6.0		SPI 10252
						250											4.50	11.3		SPI 10302
						250						1.46	80				1.50	3.0		SPI 10311

specifications system, however, has many problems. Each industry requires various materials that may differ only slightly from those used by another industry. These differences are the main reason for the varied systems of today, and until they can be incorporated into one master system, or the industries re-educated to use the similar material, the problem is far from a quick solution.

The various technical societies, which naturally like to have specifications of their own for use in the industries with which they are allied, present another difficulty. These different societies must become closely co-ordinated in order to make a single specifications system work. Each society must contribute its share and no one group must control exclusively the specifications of a given material. This means the elimination of the selfish elements within each group and the establishing of a broader outlook by the societies for the betterment of all manufacturing and not alone for a small controlled group.

It would certainly be a big step in the right direction if one single materials specification were established. In addition to other advantages, mills and plants producing raw and finished materials controlled by specifications would welcome the clarification and simplification resulting.

SAE Number	Nominal Chemical Ranges C	Mn	P Max	S Max	Corresp AISI Number
1008	0.10 max	0.30–0.50	0.040	0.050	C1008
1010	0.08–0.13	0.30–0.50	0.040	0.050	C1010
1015	0.13–0.18	0.30–0.50	0.040	0.050	C1015
(*X1015*) 1016	0.13–0.18	0.60–0.90	0.040	0.050	C1016
1020	0.18–0.23	0.30–0.50	0.040	0.050	C1020
(*X1020*) 1022	0.18–0.23	0.70–1.00	0.040	0.050	C1022
1024	0.20–0.26	1.35–1.65	0.040	0.050	C1024
1025	0.22–0.28	0.30–0.50	0.040	0.050	C1025
1030	0.28–0.34	0.60–0.90	0.040	0.050	C1030
1035	0.32–0.38	0.60–0.90	0.040	0.050	C1035
1036	0.32–0.39	1.20–1.50	0.040	0.050	C1036
1040	0.37–0.44	0.60–0.90	0.040	0.050	C1040
1045	0.43–0.50	0.60–0.90	0.040	0.050	C1045
1050	0.48–0.55	0.60–0.90	0.040	0.050	C1050
1052	0.47–0.55	1.20–1.50	0.040	0.050	C1052
1055	0.50–0.60	0.60–0.90	0.040	0.050	C1055
1060	0.55–0.65	0.60–0.90	0.040	0.050	C1060
(*X1065*) 1066	0.60–0.71	0.80–1.10	0.040	0.050	C1066
1070	0.65–0.75	0.70–1.00	0.040	0.050	C1070
1080	0.75–0.88	0.60–0.90	0.040	0.050	C1080
1085	0.80–0.93	0.70–1.00	0.040	0.050	C1085
1095	0.90–1.05	0.30–0.50	0.040	0.050	C1095

Fig. 3—Perhaps a single system could be based on that used by the Society of Automotive Engineers for steels. Specification number indicates the type of steel, nominal amount of predominant alloying element, and nominal carbon content. With appropriate suffixes to indicate properties, this basic system offers possibilities.

. . . number of systems might be reduced

By R. D. Zonge

Chief Metallurgist, Lycoming Division, The Aviation Corporation, Williamsport, Pa.

A SINGLE material specification system would not be practicable even though it may be desirable. There is the hope, however, that the existing systems could be reduced in number to eliminate some of the confusion existing today.

The Federal Government and the Services must, of course, have procurement specifications since they are compelled to buy from the lowest bidder. Industry, on the other hand, would not be content to live with such a system or systems of specifications.

There is no need, however, for the duplication of specifications caused by each government agency having its own system. One or two systems common to all branches should suffice. The possible question of two systems is acknowledged because of the need for differentiation between commercial quality materials or products, and aircraft or special quality materials or products which may be of the same analysis and have fundamentally the same physical properties. The AMS group specifies both aircraft and commercial quality materials otherwise basically alike in the same system, although it is granted that these instances are not numerous.

Industry's side of the picture is much like that of government's except that it is more complicated by large quantity needs of somewhat special quality material, and the fact that the most common specification systems (SAE and AISI) are not procurement specifications. These systems are merely chemical composition limits with no reference to hardness, finish, physical properties, hardenability, or quality. The same is true of most specifications of the materials-producing companies.

The AMS and ASTM series are procurement specifications, but the AMS were written primarily for the aircraft industry and the majority of materials described are special quality, while the ASTM were prepared for other special industries and cover commercial quality materials.

It is possible that two agencies, such as these, could cover the industrial field, and eventually even combine into a single numerical system. Probably wider acceptance and use of the hardenability test as an additional means of specifying steel will help to reduce the number of specification systems now in use.

. . . would be a distinct advantage to all

By George N. Barrett, Jr

Chief Metallurgist, Cleveland Pneumatic Tool Company, Cleveland

ESTABLISHMENT of a single set of materials specifications would be a distinct advantage to all parties concerned. The steel industry, as an example, would have fewer specs to make and, therefore, there would be a much smaller number of missed or "off" heats. Steel of this type is a serious handicap and burden, causing disruption of schedules, broken shipping promises, and occasionally entailing considerable loss of money. This same condition would prevail in other materials plants.

In respect to the users or fabricating plants, the confusion due to the multitudinous volumes of specs reached its peak during the war. It grew so great that some of the smaller shops were forced to expend money setting up specification departments to keep up to date on all specifications. Even the large indus-

tries, which normally write their own specs, were confronted with unfamiliar Army, Navy, and Air Corps Specs. No doubt the greatest confusion occurs in the purchasing departments where engineering and metallurgical requirements call for a type of material under a certain specification. When this is not obtainable, usually a substitute is offered in another specification system. The buyer then is confronted with the question: Is this the same type and quality of material as specified by his engineering department or is it in some way inferior? By the time he gets this question answered by an already busy or overworked engineering or metallurgical department, considerable time is lost and sometimes even the material—it being sold to another buyer.

The writer knows of a plant where 35 to 40 percent of their rough material orders (steels, brasses, bronzes) had to be filled by substitutes. This was true even though SAE standards usually were specified. The majority of the above orders were for warehouse quantities which was a large factor in the number of substitutions that had to be made. It is the small manufacturer—the warehouse customer—whose costs must be held to a minimum in order to survive competition and reconversion, who suffers the greatest confusion and delay due to nonstandardized specifications.

Manufacturers, large and small, would certainly benefit greatly and a lot of their purchasing headaches would be eliminated if one set of materials specifications could be standardized for the nation. The writer cannot see why this would not be possible. Other countries have done it and, advanced in engineering as we are, we certainly are capable of doing it. Surely we need it more now than ever before.

. . . desirable . . . but problem is extremely complex

By A. E. Gibson

President, The Wellman Engineering Company, Cleveland

IT WOULD be desirable for equipment builders, such as we are, to have single materials specifications, but we do not believe that it would be possible to get government agencies and industry to adopt them.

Take, for instance, the steel industry for which we build equipment. Practically every company has its own ideas on specifications and materials and they insist their equipment be built to them.

Yards and Docks Division of the Navy have recently adopted a specification that all important steel castings such as trucks and equalizers be subject to x-ray examination. This is costly and time-consuming. Yards and Docks are willing to pay the price, but industry will not.

Some steel companies call for a factor of safety of 5 or 6. One, the largest, insists upon 10 on highly stressed equipment. Some companies insist all gears be hardened, others will take them of lower brinell.

I could cite hundreds of similar cases which make the problem so complex that I question ever arriving at one set of standards acceptable to everyone.

. . . societies should welcome chance for collaboration

By George Webb

Director, Research and Development, Colt's Patent Fire Arms Manufacturing Company, Hartford, Conn.

THERE are approximately 2000 specifications on steel alone and 1500 specifications on nonferrous metals. This summary is based on the cross index prepared by the General Motors Corporation at the request of the United States Armed Services and revised March 1, 1945. During the war emergency, there were a great many headaches caused by slight variations between one specification and another which resulted in many a delay in the production line, whereas the variation would not have affected the completed part.

Certainly the various agencies and societies which have a major part in the preparation of specifications would welcome an opportunity to determine whether the various codes and specifications now in use could be materially reduced. Were this reduction accomplished, it would surely be welcomed by both mill and manufacturer.

. . . need exists . . . will be difficult, require time

By J. Perina

Standards & Materials Engineer, Republic Aviation Corporation, Farmingdale, Long Island, N. Y.

BASICALLY, the need for such a system exists and its acceptance would simplify the entire material manufacturing and procurement problem. But it is to be expected that no one set of existing specifications will completely satisfy all requirements. Special applications requiring special materials will continue to crop up. This is unavoidable and, in some cases, necessary if progress is to be made and competition is to flourish.

Establishing a standard set of specifications, like any other form of standard, will be difficult and will take a great deal of time. Opposition from fabricators may be encountered to a great extent. In many cases such opposition may be justified due to each designer's problems or manufacturer's fabricating technique, and a solution must be offered in each of these cases.

One way in which the establishment of a standard series may be accomplished is to select the most commonly used series and expand or modify the requirements to satisfy a majority of the users.

Another obstacle to overcome, however, is the selection of the society or organization to control, publish, and designate the specifications. It is because one such organization was not designated that the present problem exists. It may be that the American Standards Association would be the most qualified and in the best position to handle this work.

Have You an Opinion on This Problem?

The American Standards Association believes that other engineers connected with ASA Company Members and Member-Bodies may have strong opinions on this important question. Any comments, pro or con, or suggestions for a solution, will be received with interest.

News from other countries

Latin-American Standards Now Number More Than Five Hundred

Progress of standardization in Latin America is reported by E. A. Pratt, Manager, International Relations, of the ASA

THE Latin-American standardizing bodies with which the American Standards Association collaborates have up to the present produced over 500 standards in the form of codes, specifications, and methods of test. All of these have been developed within the past nine years and most of them since 1940. The types of standards being set up, and the relative number of each type in the different countries, illustrate the progress and trend of standardization in Latin America.

About half the total of 500 Latin-American standards are Brazilian. Two-thirds of these are products of the Brazilian Standards Association (ABNT); the remainder were developed by the Technical Research Institute of São Paulo, which was the first organization to undertake technical standardization in Brazil. This Institute cooperates very closely with the national standardizing association and a considerable number of its standards have been converted into national standards under the ABNT procedure. This appears to represent a definite policy.

In all of the Latin-American countries, standards applicable to engineering construction occupy an important place. Thirty-three percent of all Brazilian standards are in this field, and the average for all Latin-American countries is 25 percent. There are codes, such as Brazilian NB-1 and NB-2 covering the design and construction of reinforced concrete buildings and bridges, and many specifications and methods of test applicable to cement, reinforcing steel, structural steel, bricks, tiles, etc. Other classes of standards in Brazil reflect the nature of the national resources, important fields of standardization being mining and minerals, and vegetable products and oils. An important standard is the electrical installation code, which has recently been officially adopted for use throughout the country.

Paint Standards Important in Argentina

In the Argentine the pattern is somewhat different. Paints and varnishes, and their raw materials, constitute the most important field so far as numbers are concerned. Twenty-five percent of the Argentine standards are of this type. Next in importance come electrical standards, and those applicable to ferrous metals and metallurgy. Engineering construction has received much less attention—less than in any other Latin-American country—and accounts for only eight percent of the total number of Argentine standards.

The Mexican standards so far developed are known as "quality" standards and invariably apply to goods that are bought and sold in the market. About 30 percent of the total apply to chemical products. The other important group covers construction materials. Methods of test are not set up as separate standards, but form parts of the standard specifications.

Uruguay Stresses Standards for Construction Materials

The standards institute of Uruguay has produced 27 standards, more than half of which are for construction materials or methods of test for these materials.

The Chilean standards body, which was recently formed, has not yet published any standards, but has organized 11 specialized groups to deal with such subjects as construction materials, electrical products, mining and minerals, chemical products, vegetable substances, and other subjects.

Most notable in a review of Latin-American standards is the comparative unimportance of mechanical engineering standards—three percent of the total in Brazil, nine percent in Argentina, and none at all in Mexico or Uruguay. Nor has Chile organized a committee to deal specifically with this subject. The industrialization now being promoted in some of these countries will, no doubt, alter the present picture. Fundamental or basic standards such as units, symbols, reference temperatures, and conversion tables, have been developed only in Argentina.

Engineering drawing, however, is receiving consideration in all countries except Mexico.

The economic importance of furthering the use of American Standards as background materials in countries where standardization is in such a formative stage as it now is in Latin America scarcely needs emphasis. When standards in the mechanical field are developed, it is obviously important that they be consistent with those of the other continent—North or South—of the Western Hemisphere.

ASA Resumes Contact With Italian Standards Association

The American Standards Association has received word from the U.S. Department of State that the Italian national standardizing body has been reorganized since the war and is now in good standing as a democratic organization. It is understood that the organization now returns to the status it held as an independent national standardization association before it entered the Confederazione Generale Fascista dell'Industria Italiana. Copies of recent publications of the Ente Nazionale per l'Unificazione nell'Industria (UNI) have been received by ASA and copies of recent American Standards and of INDUSTRIAL STANDARDIZATION have been sent to UNI.

Australia Studies Names of Timber

A review of the standard names now in existence for Australian timber is being undertaken by the Standards Association of Australia. The work, which will be a review of Australian Standard O.2, Nomenclature of Australian Timbers, will be done by State subcommittees and coordinated by the Association's sectional committee.

The sectional committee has agreed that *Ceratopetalum apetalum* should have as its Standard Trade Common Name "coachwood" instead of "satinwood", and that "scented satinwood" be retained as one of the other Common Names.

South Africa Standards Bureau Starts Work on New Program

Numerous requests for standardization—particularly in connection with DDT, stationery, and oils—have already been routed to the newly created South African Bureau of Standards, according to various news reports from that area.

Latest press releases indicate that the bureau is well on its way toward carrying out those functions outlined by Parliament in the Standards Act of last year. Several appointments to executive positions in the bureau have been made or are pending; conferences with manufacturers, consumers, municipalities, and other bodies have been scheduled; and plans for the establishment of laboratories at the Mint in Pretoria are in motion.

In outlining future activities, Mr Ritchie, who has just been appointed director of the bureau, disclosed that consideration is being given to the choice of a design which will serve as a standard mark certifying quality of production. "We would like to help people to a better understanding of standards," he said. "For the 'over the counter' customer, the sight of our standard mark on any commodity will be sufficient to tell him the quality of his purchase. If we can encourage the customer to buy a reliable article carrying the standard mark, then inferior goods of the same type will either have to come into line in quality, or fade away altogether."

In addition, the bureau also intends to establish a textile testing laboratory, in which the quality and components of all textiles will be evaluated, and will assume use of the measuring equipment from the Inspection Department of the War Supplies Organization.

Belgian Standards Now Under Government

A new Belgian standards institution which will be government-sponsored was formed on February 25, 1946, under the chairmanship of M. De Smaele, Minister of Economic Affairs. The Institut Belge de Normalisation, as it will be known, succeeds the Association Belge de Standardisation which was founded in 1919.

Based upon a decree issued on September 20, 1945, the Institute has been entrusted:

(1) To study and to have studies made of standardization in all fields;
(2) To centralize and coordinate standardization work in Belgium;
(3) To spread the knowledge of the results of this work among those interested;
(4) To collaborate, in the field of standardization, with similar foreign institutions and to participate in the work of international standardizing bodies.

Gustave L. Gerard and Max Reichert, who have both served with the old Association at different times in the capacity of secretary, are now president and director, respectively. In a joint letter to the ASA announcing this reorganization, they expressed the belief that the new Institution will be in a position to develop fully Belgian work on standards, since it is supported by the public administrations, professional groups, and associations for scientific and technical research. However, the writers continued, "it will not interfere in any way with existing institutions, such as the Belgian Electrotechnical Committee, with which arrangements will be made with a view to the parallel pursuit of respective activities."

Australia Plans Standards For Wool Unshrinkability

Standards for unshrinkability of woolen goods for civilian use are being developed under a new project set up by the Standards Association of Australia recently. The project was requested by the Australian Wool Board which believes that unshrinkability standards are needed to protect wool products against competition from other fibers by insuring that goods marked or advertised as "unshrinkable" or "shrinkproof" comply with agreed shrinkage standards.

It is expected that standard specifications will be developed for limits of shrinkability and methods of test for socks, knitted underwear, flannel, knitted outerwear, woven fabrics, blankets, and fingering yarn.

President's Conference Urges Uniform Highway Regulation

UNIFORMITY in highway regulation was urged by President Truman at the opening session of a three-day safety conference in Washington. Speaking before more than 1500 delegates at the President's Highway Safety Conference in May, he deplored the high accident rate in the United States and called for more responsibility and cooperation from the American people. "Safety is fundamentally a private and personal responsibility which each of us must recognize and accept," he said. "I am confident that drivers and pedestrians everywhere will respond wholeheartedly to our appeal for safe and sensible conduct.

"Government, of course, bears a primary obligation to the public safety," he continued. "The provision of safe facilities for public travel, the licensing of vehicles and drivers, the regulation of traffic movement, and the education and training in highway safety through our schools, all are responsibilities of local, State, and Federal Government."

The agenda for the Conference had been previously drafted by eight committees which were asked to prepare preliminary reports for submission to the Conference delegates. These reports were intended to embrace all phases of highway accident prevention and covered such topics as accident records, education, enforcement, engineering, laws and ordinances, motor vehicle administration, public information, and organized public support. The recommendations were later referred to the Conference for endorsement.

From ensuing discussions the principles for a master plan were evolved —one which, it is expected, will result in an annual saving of 19,000 lives, prevention of injuries to 650,000 persons, and elimination of more than $1,000,000,000 in costs.

One of the main elements of the plan is to organize coordinating committees on federal, state, and local levels which will consider application of the Conference recommendations within their own spheres. The other important feature is that State Governors be urged to call official State Highway Safety Conferences where the work of the coordinating committees can be reviewed and where an active program can be formulated.

Among the final recommendations approved was a suggestion for the enactment of a uniform vehicle code and a model traffic ordinance in each state and municipality which would also be subject to uniform interpretation, application, and enforcement. States were also requested to adopt sound policies and procedures in the field of motor vehicle administration, with special attention to driver licensing, vehicle inspection, and other regulatory measures affecting highway safety. The need for an adequate safety program in schools and communities was emphasized. To create more public awareness of the problem, frequent campaigns and safety contests were proposed, using all available media of public information. It was pointed out that agreement among the States on the method of recording accident statistics and reports would make resultant facts and figures more useful. Engineering departments were advised of the desirability for uniformity in traffic signals, signs, and markings. They were also urged to work for the elimination of hazards both on the highway and in automobile design.

Highway Officials Recommend Standards for Motor Vehicles

THE adoption by all states of uniform standards which will regulate the maximum dimensions, weights, and speeds of motor vehicles operating over United States highways is being strongly recommended by the American Association of State Highway Officials.

In a series of recommendations approved on April 1, 1946, the Association emphatically stressed the need for such regulations and advocated their incorporation in the laws of all states. The standards, it is expected, would be based on the results of years of research conducted by various state highway departments and the Public Roads Administration—all members of the Association.

What Standards Would Accomplish

Results from the compiling of all essential facts have indicated to the Association that the adoption of the standards recommended would *(a)* establish one of the fundamental prerequisites of highway design; *(b)* promote efficiency in the interstate operation of motor vehicles; *(c)* promote the safety of highway transportation; and *(d)* establish a present basis for regulation of the many relationships between the dimensions and weights of motor vehicles and the strengths and capacities of existing highways.

The standards recommended are as follows:

(1) *Width.* No vehicle, unladen or with load, shall have a total outside width in excess of 96 inches.

(NOTE: It is recognized that certain conditions inherent in the design of vehicles suggest the desirability of 102 inches as a standard of maximum width. The existence of numerous bridges and a large mileage of highways too narrow for the safe accommodation of vehicles of such width precludes the present adoption of the higher standard of width. The State highway departments and Public Roads Administration are urged to give consideration to the desirability of eventual provision for the accommodation of vehicles 102 inches in width in planning the reconstruction of Federal-aid and State highways.)

(2) *Height.* No vehicle, unladen or with load, shall exceed a height of 12 feet, 6 inches.

(3) *Length.*

(a) No single truck, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 35 feet.

(b) No single bus, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 40 feet, provided that a bus in excess of 35 feet in overall length shall have not less than 3 axles.

(c) No combination of truck-tractor and semi-trailer, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 50 feet.

(d) No other combination of vehicles shall consist of more than two units, and no such combination of vehicles, unladen or with load, shall have an overall length, inclusive of front and rear bumpers, in excess of 60 feet.

(4) *Speed.*

(a) Minimum speed. No motor vehicle shall be unnecessarily driven at such slow speed as to impede or block the normal and reasonable movement of traffic. Exception to this requirement shall be recognized when reduced speed is necessary for safe operation or when a vehicle or combination of vehicles is necessarily or in compliance with law or police direction proceeding at reduced speed.

(b) Maximum speed. No truck shall be operated at a speed greater than 45 miles per hour. Passenger vehicles may be operated at such speeds as shall be consistent at all times with safety and the proper use of the roads.

(c) Vehicles equipped with solid rubber or cushion tires shall be operated at a speed not in excess of 10 miles per hour.

(5) *Permissible Loads.*

(a) No axle shall carry a load in excess of 18,000 pounds.

(NOTE: An axle load shall be defined as the total load transmitted to the road by all wheels whose centers may be included between two parallel transverse vertical planes 40 inches apart, extending across the full width of the vehicle.)

(b) No group of axles shall carry a load in pounds in excess of the value given in the table corresponding to the distance in feet between the extreme axles of the group, measured longitudinally to the nearest foot.

[A table of values is included in the report at this point.]

(c) The maximum axle and axle-group loads recommended in paragraphs *(a)* and *(b)* above are subject to reasonable reduction in the discretion of the appropriate highway authorities during periods when road subgrades have been weakened by water saturation or other cause.

(d) The operation of vehicles or combinations of vehicles having dimensions or weights in excess of the maximum limits herein recommended shall be permitted only if authorized by special certificate issued by an appropriate State authority.

New Standards from Other Countries

THE following new and revised standards, received recently by the American Standards Association from other countries, may be borrowed by ASA Members from the ASA Library or purchased through the Sales Department.

Drafts of standards from other countries are not for sale. They may be borrowed.

Great Britain

New British Standards

Clay Engineering Bricks, BS1301:1946, 40¢
Dimensions of Festoon Lamp Caps for Voltages Not Exceeding 50, BS1298: 1946, 40¢
Jointing Compound for Screwed Joints, BS1261:1945, 75¢
Jointing Paste for Flange and Similar Type Joints, BS1260:1945, 75¢
Photographic Masks for Contact Printing, BS1302:1946, 40¢
Screen Analysis of Coal, BS1293:1946, $1.25
Softwood Tongued and Grooved Flooring, BS1297:1946, 75¢
Solid Fuel Cookers and Combination Grates, BS1252:1945, 75¢
Soot Doors for Domestic Buildings, BS1294: 1946, 75¢
Tumbler Switches, BS1299-Part 1:1946, 75¢
Wire Rope Slings and Sling Legs, BS1290:1946, $1.25

Revised Standards Issued

Carbon & Alloy Steels, STA/5:1945, $2.65
Reinforced Concrete Poles, BS607:1946, 75¢

Drafts of Proposed Standards

Symmetrical Light Distribution from Lighting Fittings, Classification of, (Draft Revision of BS398), CH(ELG)4031

Draft Code of Practice

Gas Heated Appliances for Laundering and Ancillary Domestic Purposes, Installation of, CP(B)582

Foreign Language Standards

The following standards are available solely in the language of the country issuing them.

France

P01-007, Dimensions des constructions (Modalités d'application de la norme P01-001)
P01-010, Dimensions des constructions: Escaliers droits en charpente
P01-011, Dimensions des constructions: Escaliers droits en maçonnerie
P23-435, Bâtiment: Menuiserie—Châssis et imposte à soufflet à double feuillure, Type 37-61
Q01-004, Papier: Nomenclature des appellations des couleurs de papiers et cartons
Q13-004, Papier: Caractéristique des catégories de papiers kraft pour isolants stratifiés
Q15-010, Papier: Caractéristique des catégories de papiers supports pour papiers à reports et décalcomanies
R124-02 (Ex BNA 109), Fenêtres de prise de mouvement: Automobile
T47-101, Caoutchouc: Courroies transporteuses—Détermination de l'adhérence entre plis et entre revêtement et plis
T47-102, Idem: Résistance à la rupture et allongement sur bande entière
T47-103, Idem: Essai d'absorption d'eau
T47-104, Idem: Vieillissement
U73-211, Machinisme agricole: Rondot de fromagerie de 25 litres
U73-212, Machinisme agricole: Moule à camembert
U73-213, Machinisme agricole: Moule à port-salut
V25-007, Conditionnement des produits coloniaux—Graines de ricin
Z09-002, Documents administratifs: Signes de corrections dactylographiques
Z11-004, Documents administratifs: Bordereau d'enregistrement
Z11-005, Documents administratifs: Bordereau d'envoi
Z21-001, Documents administratifs: Imprimés d'état civil—Bulletin de naissance
Z21-002, Documents administratifs: Imprimés d'état civil—Extrait d'acte de naissance
Z21-003, Documents administratifs: Imprimés d'état civil—Bulletin de mariage
Z21-004, Documents administratifs: Imprimés d'état civil—Extrait d'acte de mariage
Z21-005, Documents administratifs: Imprimés d'état civil—Bulletin de décès
Z21-006, Documents administratifs: Imprimés d'état civil—Extrait d'acte de décès

Mexico

Alambre de hierro o acero revestido de zinc (galvanizado), B15-1945
Alambre magneto de cobre, de sección circular, esmaltado, J4-1945
Almidón de maíz, K20-1945
Bronce en lingotes utilizado en vaciados en moldes de arena, B16-1945
Cacodilato de fierro (ferrico), K18-1945
Carbón bituminoso, R3-1945
Carburo de calcio, K23-1945
Cloruro mercuroso (calomel), K17-1945
Coque metalúrgico, P2-1945
Hilo de algodón para forro de alambre de magneto, A6-1945
Eter (etano oxietano), K19-1945
Glicerina, K22-1945
Ladrillos de forma prismática rectangular de arcilla refractaria, C14-1945
Oxicianuro de mercurio, K21-1945
Rieles ordinarios de acero (Martín-Siemens), B17-1945
Tabique de concreto, C10-1945
Tabique hueco de barro, C13-1945

—New Standards in ASA Library—

For the information of ASA Members, the American Standards Association publishes a selected list of standards as they are received by the ASA Library. The list below includes only those standards received recently which the ASA believes are of greatest interest to Members.

These standards may be consulted by Members at the ASA Library, or copies may be obtained from the organization issuing the standard. The address of the organization is included for convenience in ordering.

Associations and Technical Societies

American Institute of Electrical Engineers
(33 West 39th Street, New York 18, N. Y.)

Electric Installations on Shipboard, Recommended Practice for, No. 45, December 1945, $2.00
Expulsion Type Distribution Lightning Arresters, No. 47, December 1945, (Proposed standard for trial use)
Preferred Standards for Large 3600-Rpm 3-Phase 60-Cycle Condensing Steam Turbine-Generators (Larger than 10,000-Kw Rated Capacity), No. 601, combined with Standard Specification Data for Generators, No. 602, May 1945, 30¢
Test Code for Synchronous Machines, No. 503, June 1945, 60¢

National Electrical Manufacturers Association
(155 East 44th Street, New York 17, N. Y.)

Hot Plates and Disc Stoves, Standards for, Pub. No. 46-113, 30¢
Large Air Circuit Breakers, Standards for, Pub. No. 46-109, $2.50
Portable Radiant Heaters, Standards for, Pub. No. 46-114, 30¢
Roasters, Standards for, Pub. No. 46-115, 30¢
Speed Governing and Pressure Control of Steam-Turbine Generator Units, Pub. No. 46-112, 50¢
Vulcanized Fibre, Standards for, Pub. No. 46-111, 25¢

Society of Automotive Engineers, Inc
(29 West 39th Street, New York 18, N. Y.)

A complete set of the specifications listed below may be obtained at 95¢
Aluminum Alloy Sheet
- Magnesium Chromium (52S-O), AMS 4015B
- Magnesium Chromium (52S-¼H), AMS 4016B
- Magnesium Chromium (52S-½H), AMS 4017B
- Manganese (3S-O), AMS 4006A
- Manganese (3S-½H), AMS 4008A

Aluminum Alloy Sheet, Aluminum Covered
- Copper Magnesium Manganese (Alc 24S-O), AMS 4040B

Society of Automotive Engineers—Continued
- Copper Magnesium Manganese (Alc 24S-RT), AMS 4042B
- Copper Magnesium Manganese (Alc 24S-T), AMS 4041B

Aluminum Alloy Sheet and Plate
- Copper Magnesium Manganese (24S-O), AMS 4035B
- Copper Magnesium Manganese (24S-T), AMS 4037B
- Copper Manganese Magnesium (17SO), AMS 4030C
- Copper Manganese Magnesium (17S-T), AMS 4032C
- Magnesium Silicon Copper (61S-O), AMS 4025A
- Magnesium Silicon Copper (61S-T), AMS 4027A
- Magnesium Silicon Copper (61S-W), AMS 4026A

Aluminum Sheet
- Annealed, AMS 4000A
- (2S-O), AMS 4001A
- (2S-½H), AMS 4003A

Bearings, 71 Copper 28 Lead 1 Silver, Steel Backed Castings, AMS 4820A
Bronze Castings, Copper Tin, AMS 4845C
Bronze Castings, Copper Tin Lead Zinc, AMS 4855A
Magnetic Particle Inspection, AMS 2640B
Steel, Nitriding, .65 Ni 1 Cr 1 Mo, AMS 6480
Tolerances, Aluminum and Aluminum Alloy Sheet and Plate, AMS 2202A

The Tire and Rim Association, Inc
(2001 First-Central Tower, Akron 8, Ohio)

Truck-Bus Handbook, 1946, (Tire and Rim Standards Included), $1.00

U.S. Government

Wherever a price is indicated, the publication may be secured from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. In other cases, copies may be obtained from the government agency concerned.

Army Air Forces

Material and Process Specifications, Bulletin No. 23, April 1946
Material and Process Specifications, Bulletin No. 23, May 1946

National Bureau of Standards
(Washington 25, D. C.)

Simplified Practice Recommendations

Bolts and Nuts, R169-45, 10¢
Handles; Hickory, R77-45, 5¢
Luggage, R215-46, 5¢
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Standards Branch
(Room 6046, Procurement Division Building, 7th & D Streets, SW, Washington 25, D.C.)

Federal Specifications are prepared for use by all government departments and establishments in their purchases. Copies are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 5 cents each. Requests should be accompanied by cash, check, or money order.

As a service to Company Members, the ASA maintains a sale file of all Federal Specifications. These specifications can be purchased from the ASA Sales Department.

Federal Specifications

Bars; Reinforcement, (for) Concrete, (Superseding Amendment 1 & Emer Alt E-QQ-B-71a), (Amendment 2), QQ-B-71a, March 1946
Cable and Wire; Varnished-Cloth-Insulated (0 to 5000-Volt Service), (Amendment 1), J-C-138, May 1946
Cable and Wire; Weather-Resistant, J-C-145, February 1946
Cans, Milk; Steel, Tinned, (Superseding Emer Alt Fed Spec E-RR-C-83), (Amendment 1), RR-C-83, May 1946
Cement, Temporary; Antiseptic, Dental, U-C-208, March 1946
Copper; Anodes, QQ-C-493, April 1946
Dressing; Leather, Transmission-Belt, (Superseding Amendment 1), (Amendment 2), TT-D-636, April 1946
Enamel; Heat-Resisting (400° F), Black, (Superseding Amendment 1), (Amendment 2), TT-E-496, March 1946
Floor-Covering; Rubber, Sheet, (Superseding Amendment 1 and Emer Alt Fed Spec E-ZZ-F-461), (Amendment 2), ZZ-F-461, March 1946
Gaskets; Rubber (Natural or Synthetic), Molded, Sheet, and Strip (Superseding HH-G-156a), HH-G-156b, March 1946
Grease; Lubricating, Graphite, (Amendment 1), VV-G-671b, April 1946

ASA Standards Activities

American Standards

American Standards Approved Since Our June Issue

Building Code Requirements for Light and Ventilation, A53.1-1946

Endorsing Sponsor: U.S. Public Health Service

Building Regulations for Reinforced Concrete, A89.1-1946 (ACI 318-41)

Sponsor: American Concrete Institute

Requirements for Grandstands, Tents, and Other Places of Outdoor Assembly, Z20.2-1946

Sponsors: Building Officials Conference of America, Inc; National Fire Protection Association

Standards Being Considered by ASA for Approval

Construction and Maintenance of Ladders and Stairs for Mines, M12.1 (Revision of American Tentative Standard on Construction and Maintenance of Ladders and Stairs for Mines, M12-1928)

Sponsor: American Mining Congress

Motion Picture Photography

Sponsor: Society of Motion Picture Engineers

Theater Projection Rooms (Revision of American Recommended Practice, Z22.28-1941, to be designated as Proposed American Standard Dimensions for Motion Picture Theater Projection Rooms, Z22.28)

Theater Projection Screens (Revision of American Recommended Practice, Z22.29-1941, to be designated as Proposed American Standard Dimensions for Motion Picture Theater Projection Screens, Z22.29)

Safety Film (Revision of Recommended Practice Z22.31-1941 Proposed American Standard Definition for Motion Picture Safety Film, Z22.31)

Photography

Sponsor: Optical Society of America

Dimensions for 35-Millimeter Film Magazines for Still Picture Cameras, Z38.1.47

Reels for Processed Microfilm, Z38.7.17

Specifications for Microfilm Readers, Z38.7.9

Specifications for 35-Millimeter Slidefilm Projection Rolls, Z38.3.3

Standard Submitted to ASA for Approval

Specifications for Gypsum Plastering, A42.1 (Revision of American Standard Specifications for Gypsum Plastering, A42.1-1942)

Sponsors: American Institute of Architects; American Society for Testing Materials

New Projects Being Considered

Identification and Cataloging of Antifriction Bearings

Standards for Home and Farm Freezers

Standards for a State Electrical Inspection Law and Municipal Electrical Inspection Ordinance

American War Standards

War Standards Under Way

Allowable Concentration of Trichloroethylene, Z37

Radio Noise, Methods of Measuring, C63

Interference Measurement, Radio, Methods of,

150 Kilocycles to 20 Megacycles (for Components and Complete Assemblies) (JAN-I-225)

Screw Threads, B1

Buttress Threads

High-Duty Studs in Light Alloys

Instrument Threads

Stub Acme Threads

Unification of Screw Threads

Women's Industrial Clothing, L17

Jackets for Outdoor Wear (Slide Fastener Closure), L17.6

Jackets for Outdoor Wear (Fly-Type Button Closure), L17.5

Wood Poles, O5

Ultimate Fiber Stresses of Wood Poles, O5aWS

News About ASA Projects

Acoustical Measurements and Terminology, Z24—

Sponsor: Acoustical Society of America.

On May 9 this committee held its first meeting since October 1941. Much of the time was spent in reorganization and reinitiation of the work on various problems concerned with sound. Since security precautions during the war had restricted work on standardization in the field of underwater sound, the members voted that a new subcommittee be formed to handle this project.

Dr R. H. Bolt of the Massachusetts Institute of Technology was appointed to succeed F. R. Watson as chairman of the Z24 subcommittee on Sound-Insulation and Sound-Absorption Measurements.

The subcommittees on Noise Measurement and Sound Levels and Sound Level Meters were merged into one unit to be called the committee on Noise Measurement and Sound Level Meters.

It was decided that the next meeting will be held sometime in 1947.

Ball Bearing Nomenclature—

The Army-Navy Numbering System on Anti-Friction Bearings, recently submitted to the American Standards Association by the Secretary of the Navy with the suggestion that it be considered for general adoption by industry, will be discussed at a general conference to be held in New York on June 12. This conference has been called by the ASA which has sent

Ball Bearing Nomenclature

invitations to some 25 trade associations and technical societies to send representatives able to state the attitude of their organizations toward the approval of the Army-Navy Code as an American Standard.

Gypsum Plastering, A42.1—

Sponsors: American Institute of Architects; American Society for Testing Materials.

A revision of the 1942 edition of the American Standard Specifications for Gypsum Plastering has been submitted to the American Standards Association for approval.

Method of Measuring Radio Noise, C63—

As a result of action taken by this War Committee, a letter ballot is now being circulated for approval of the Proposed American Standard Methods of Radio Interference Measurement 150 Kilocycles to 20 Megacycles (for Components and Complete Assemblies) (JAN-I-225).

Performance Requirements for Protective Occupational Footwear, Z41—

Sponsors: National Conservation Bureau; National Safety Council.

This committee is now being reorganized preparatory to active work for the development of peacetime standards for protective footwear. During the war nine American War Standards were developed under the ASA war procedure for different types of men's and women's protective footwear, and it is expected that these standards will form the basis for the work to be undertaken by the reorganized sectional committee.

Photography, Z38—

Sponsor: Optical Society of America

Friday, September 20, 1946 has been set as a tentative date for the next meeting of Committee Z38.

Standards for Electrical Lamps, C78—

Sponsor: Electrical Standards Committee.

At a recent meeting, Subcommittee 1 on Incandescent Lamps discussed the dimensions for incandescent lamps needed in order to insure interchangeability which, until now, has existed but has never been defined.

New American Standards Available

New American Standards which are available this month are listed on pages 186 and 187.

Gear Tolerances and Inspection, Products and Lubricants, and Moti

A COMPREHENSIVE standard on safety rules for the use of x-rays in industry has been approved as an American Standard, and appears in the list of new American Standards available this month. This is the American Standard Safety Code for the Industrial Use of X-Rays. This safety code was developed during the war by an appointed committee of experts and presents, for the first time, a thorough and detailed codification of protective measures, rules, and specifications for preventing accidents in the industrial use of x-rays and radium.

In addition to the Safety Code on X-Rays, the new American Standard Gear Tolerances and Inspection is now available. It is emphasized that performance is the final criterion in the acceptance or rejection of gears, but when gears fail to perform satisfactorily, definite inspection methods and tolerances are invaluable in locating the cause.

Many of the photography and cinematography standards developed during the war have proved of such value to the industry that they are being converted to peacetime standards, and have been approved under the Z22 designation listed below. These are all single-sheet standards, and punched for binder filing. Completing the list are five ASTM standards on methods of testing petroleum products and lubricants which have been revised. These were first approved in 1943 and 1944, and revised in 1945.

American Standards Association • ASA • 70 East 45th Street, New York 17, N. Y.

No. of Copies	ASA Number	Title of Standard	Price
.....	B6.6-1946	**Gear Tolerances and Inspection**..... A practical basis upon which gears can be manufactured, inspected, sold, or purchased is outlined in this standard. The tolerances given apply to spur and helical gears, the latter including parallel and crossed helical gears, and double-helical or herringbone gears. *(Sponsors:* American Gear Manufacturers Association; American Society of Mechanical Engineers.)	.65
.....	Z11.6-1945	**Flash and Fire Points by Means of Open Cup,** Method of Test for (ASTM D92-45; API 511-45)..... The flash and fire points of all petroleum products except fuel oils and those having an open cup flash below 175 F (79C) can be determined by applying this test method. (The American Society for Testing Materials is the sponsor for the Z11 series.)	.25
.....	Z11.20-1945	**Saponification Number of Petroleum Products by Color-Indicator Titration,** Test for (ASTM D94-45; API 547-45).. To determine the amount of constituents in petroleum products that will easily saponify under the conditions of test, this method can be applied. It is applicable to new or used petroleum oils including electrical insulating oils, and to mixtures of fats and mineral oils.	.25
.....	Z11.37-1945	**Knock Characteristics of Motor Fuels,** Test for (ASTM D357-45; API 532-45)..... The field of knock testing is complex; however this method of test is intended for determining the knock characteristics of fuels for use in spark-ignition engines, other than engines for aircraft, in terms of an arbitrary scale of ASTM motor octane numbers.	.25
.....	Z11.49-1945	**Carbonizable Substance in White Mineral Oil (Liquid Petrolatum),** Method of Test for (ASTM D565-45; API 545-45)	.25
.....	Z11.50-1945	**Carbonizable Substances in Paraffin Wax,** Method of Test for (ASTM D612-45; API 544-45)..... These methods of test are applicable to white mineral oil (liquid petrolatum) and to paraffin wax to ascertain whether they conform to the standard of quality required for pharmaceutical use. The standards give the apparatus used, the reagents, the method of procedure used, and an interpretation of the results.	.25
.....	Z22.2-1946	**Emulsion and Sound Record Positions in Cameras for 35-Millimeter Sound Motion Picture Film**.....	.15
.....	Z22.3-1946	**Emulsion and Sound Record Positions in Projector for 35-Millimeter Sound Motion Picture Film**.....	.15

ndustrial Use of X-Rays, Petroleum
tin Picture Standards Now Available

No. of Copies	ASA Number	Title of Standard	Price
.....	Z22.9-1946	**Emulsion Position in Camera for 16-Millimeter Silent Motion Picture Film**.....	.15
.....	Z22.15-1946	**Emulsion and Sound Record Positions in Camera for 16-Millimeter Sound Motion Picture Film**.....	.15
.....	Z22.21-1946	**Emulsion Position in Camera for 8-Millimeter Silent Motion Picture Film**.....	.15
.....	Z22.40-1946	**Sound Records and Scanning Area of 35-Millimeter Sound Motion Picture Prints**.....	.15
.....	Z22.41-1946	**Sound Records and Scanning Area of 16-Millimeter Sound Motion Picture Prints**.....	.15
.....	Z22.42-1946	**Sound-Focusing Test Films for 16-Millimeter Sound Motion Picture Projection Equipment,** Specification for...	.15
.....	Z22.43-1946	**3000-Cycle Flutter Test Film for 16-Millimeter Sound Motion Picture Projectors,** Specifications for.....	.15
.....	Z22.44-1946	**Multi-Frequency Test Film for Field Testing 16-Millimeter Sound Motion Picture Projection Equipment,** Specifications for	.15
.....	Z22.45-1946	**400-Cycle Signal Level Test Film for 16-Millimeter Sound Motion Picture Projection Equipment,** Specifications for	.15
.....	Z22.46-1946	**16-Millimeter Positive Aperture Dimensions and Image Size for Positive Prints Made from 35-Millimeter Negatives**	.15
.....	Z22.47-1946	**Negative Aperture Dimensions and Image Size for 16-Millimeter Duplicate Negatives Made from 35-Millimeter Positive Prints**	.15
.....	Z22.48-1946	**Printer Aperture Dimensions for Contact Printing 16-Millimeter Positive Prints from 16-Millimeter Negatives.**	.15
.....	Z22.49-1946	**Printer Aperture Dimensions for Contact Printing 16-Millimeter Reversal and Color Reversal Duplicate Prints.**	.15
.....	Z22.50-1946	**Reel Spindles for 16-Millimeter Motion Picture Projectors**	.15
.....	Z22.51-1946	**Intermodulation Tests on Variable-Density 16-Millimeter Sound Motion Picture Prints,** Method of Making..	.15
.....	Z22.52-1946	**Cross-Modulation Tests on Variable-Area 16-Millimeter Sound Motion Picture Prints,** Method of Making.....	.15
.....	Z22.53-1946	**Resolving Power of 16-Millimeter Motion Picture Projector Lenses,** Method of Determining.....	.15
.....	Z22.54-1946	**Freedom from Travel Ghost in 16-Millimeter Sound Motion Picture Projectors,** Method of Determining.....	.15

The 20 single-sheet standards on photography and cinematography listed above are part of a series sponsored by the Society of Motion Picture Engineers.

.....	Z54.1-1946	**Industrial Use of X-Rays,** Safety Code for the (American War Standard)	1.50

This standard is the first major codification of safety measures in the field of industrial x-rays. It was developed during the war and is the consensus of the latest rules and specifications for preventing accidents in the industrial use of x-rays and radium. It was requested by the Division of Labor Standards, U.S. Department of Labor, after consultation with the National Bureau of Standards. Research which was carried on at the National Bureau of Standards' Laboratories contributed to the practical value of this standard. To facilitate the use of the document and the information contained therein, it has been divided into six parts—General, Use and Storage of Radium in the Field of Industrial Radiography, Methods and Materials of X-Ray Protection, Specific Applications for 400 Kilovolts and Lower, X-Ray Protection for Voltages of One and Two Million, and Electrical Protection. Particular attention has been given to the charts, drawings, and tables, and a comprehensive index facilitates the use of this 60-page document.

Now Availab

1st Safety Standard

for protection of workers using

X-Rays

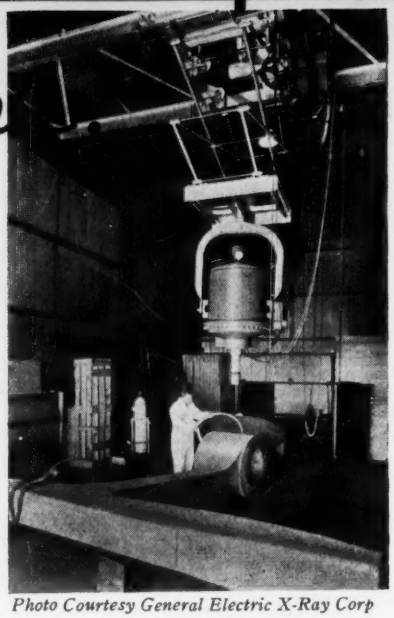

Photo Courtesy General Electric X-Ray Corp

covers—

installation, operation, use, and maintenance of industrial x-ray equipment, Part I

use and storage of radium for industrial radiography, Part II

methods and materials of x-ray protection, Part III

safe practices in x-ray applications for 400 kilovolts and lower, Part IV

safe practices in the use of x-rays of voltages of 1 and 2 million, Part V

protection against electrical hazards, Part VI

order—

American War Standard Safety Code for the Industrial Use of X-Rays, Z54.1-1946 $1.50

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